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SEPTEMBER 8, 1960

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JACKMAN MELTING EQUIPMENT

CUPOLAS · SPARK ARRESTERS · CHARGERS · LADLES

By courtesy of Messrs. Mather & Platt Ltd., Park Works, Manchester

We show a recent installation of three wet spark and grit arresters supplied to existing cupolas. The middle cupola was blowing when the photograph was taken

ALL SIZES OF HIGHLY EFFICIENT WET AND DRY TYPE SPARK AND GRIT ARRESTERS CAN BE SUPPLIED FOR NEW AND EXISTING INSTALLATIONS

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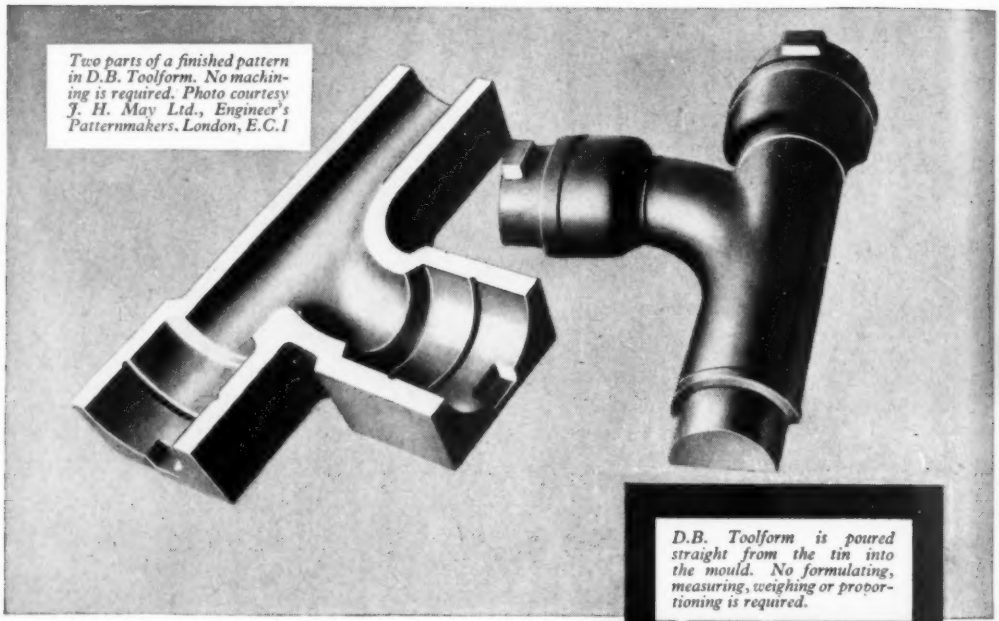

Two parts of a finished pattern in D.B. Toolform. No machining is required. Photo courtesy J. H. May Ltd., Engineer's Patternmakers, London, E.C.1

D.B. Toolform is poured straight from the tin into the mould. No formulating, measuring, weighing or proportioning is required.

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THE TOUGH EPOXIDE PLASTICS

D.B. Toolform simplifies foundry pattern-making and results in a superior job at an economical cost.

HERE ARE SOME OF THE ADVANTAGES

Better abrasion resistance than aluminium • Does not sweat • Patterns can be modified easily at any time • Damage can be quickly repaired • Large patterns can be of hollow construction • Stable when cured • Unaffected by most liquids • Can be stored in the open • No double shrinkage allowance required • Extremely low cost compared with metal patterns.

double bond db TOOLFORM

Please send me literature giving further details of the applications and advantages of D.B. Toolform.

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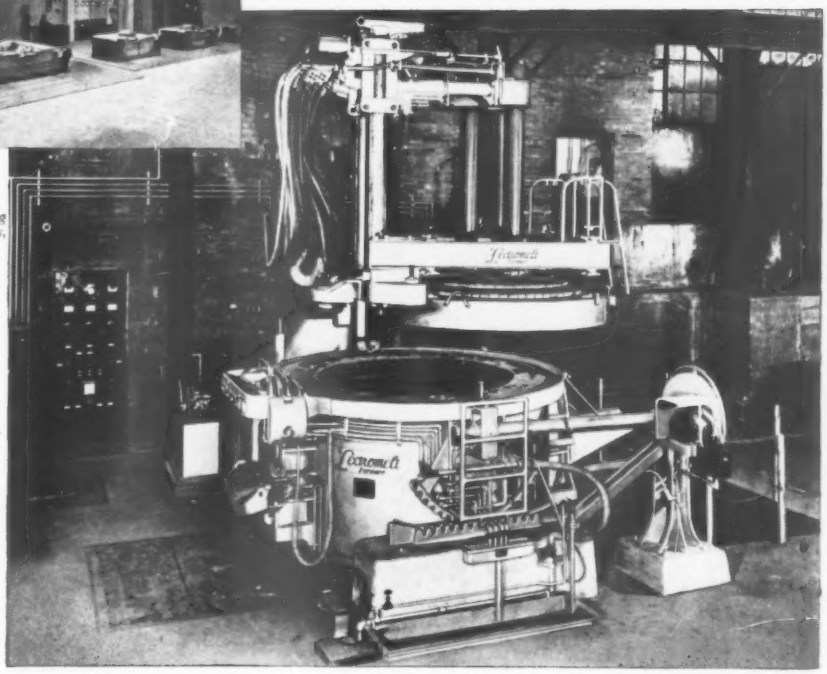
FTJ7

GWB

DEMAG

Lectromelt

Demag high-frequency induction furnace installation at a steel making plant, incorporating two 1 ton capacity furnaces, two 660 lb. capacity furnaces, and one 110 lb. capacity furnace.



A 3 ton capacity Lectromelt arc furnace of 9' 0" diameter shown with roof swung ready for charging.

High Speed and High Output are the key features in the medium and smaller range of furnaces offered by G.W.B. Furnaces Ltd. Many years of experience are behind both the Coreless and Arc Furnaces of Demag and Lectromelt designs. Daily, electric furnaces are finding wider and wider applications, and the coreless induction (crucible) type is no exception as it is an ideal medium for melting steel and iron, and all other metals. It is particularly advantageous in steel works where a charge of scrap of known analysis is melted and is an installation that pays for itself in a very short time. The proven economies of operation of electric arc furnaces offered by G.W.B. have earned an enviable reputation, and a few of their outstanding features are:—
Separately mounted roof lift and swing mechanism for top charging; Four point roof suspension of the roof ring; Electrode holders of the power operated, spring-held, air release type; High speed movement of the electrodes; Offset rocker centres to return furnace from extreme tilt in event of power failure.

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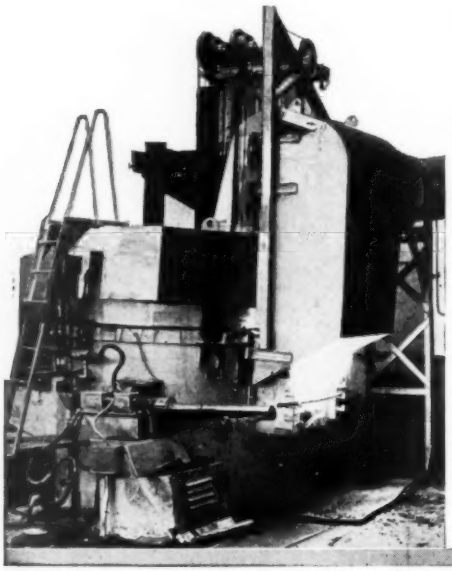
Proprietors: Gibbons Bros. Ltd., and Wild-Barfield Electric Furnaces Ltd.

GWB 141

TILGHMAN'S DUST COLLECTORS



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a complete installation at Arthur Balfour & Co., Ltd. Sheffield

ELECTRIC FURNACE HOODS

Tilghman's specialise in the design, manufacture and supply of equipment for extracting fumes emitted from electric arc furnaces, either by fitting an exhaust hood, as illustrated, or alternatively by direct extraction from the furnace body.

TUBULAR FABRIC COLLECTORS

Automatic bag filter plants with synthetic filter tubes ensure *no visible discharge to the atmosphere even during oxygen lancing.*

The plant illustrated has now been operating over eighteen months without any tube replacement.

TILGHMAN'S LIMITED

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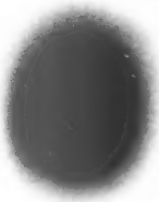
W.253

a
burning
problem



solved
overleaf

SHELL

A poorly finished casting, rough and blemished, can lose an order — and a reputation. Protect both. Ensure first-class finish with Foseco inflammable mould and core dressings. They are consistent. They are *not* expensive. They burn smoothly and evenly. They result in best possible finish. And one of the reasons why Foseco 'fired' dressings achieve such consistently good results is that they contain Shell I.P.S. — isopropyl alcohol — the ideal solvent.

This grey iron casting was produced by Bodley Bros. & Co. Ltd. of Exeter. Machined, it weighs 5 tons 6 cwt. Diameter is 12' 6". Teeth are 15 inches wide. Foseco Flamco and Shell I.P.S. were used for dressing the mould and cores. Flamco is the finest graphite dressing in powder form; I.P.S. is top quality isopropyl alcohol.

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Foseco

fired dressings with **SHELL I.P.S.**

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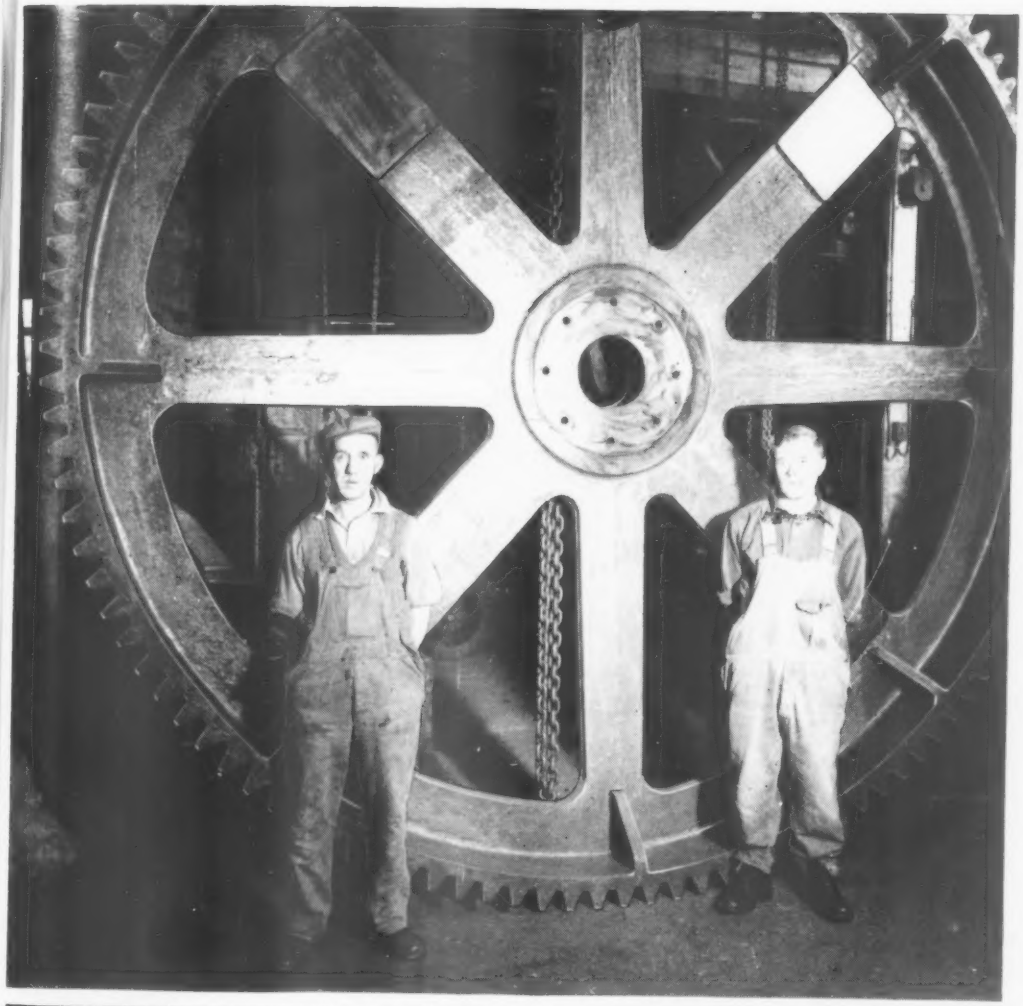
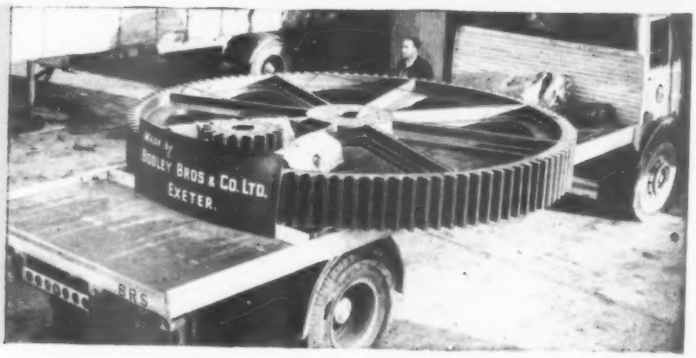


SHELL



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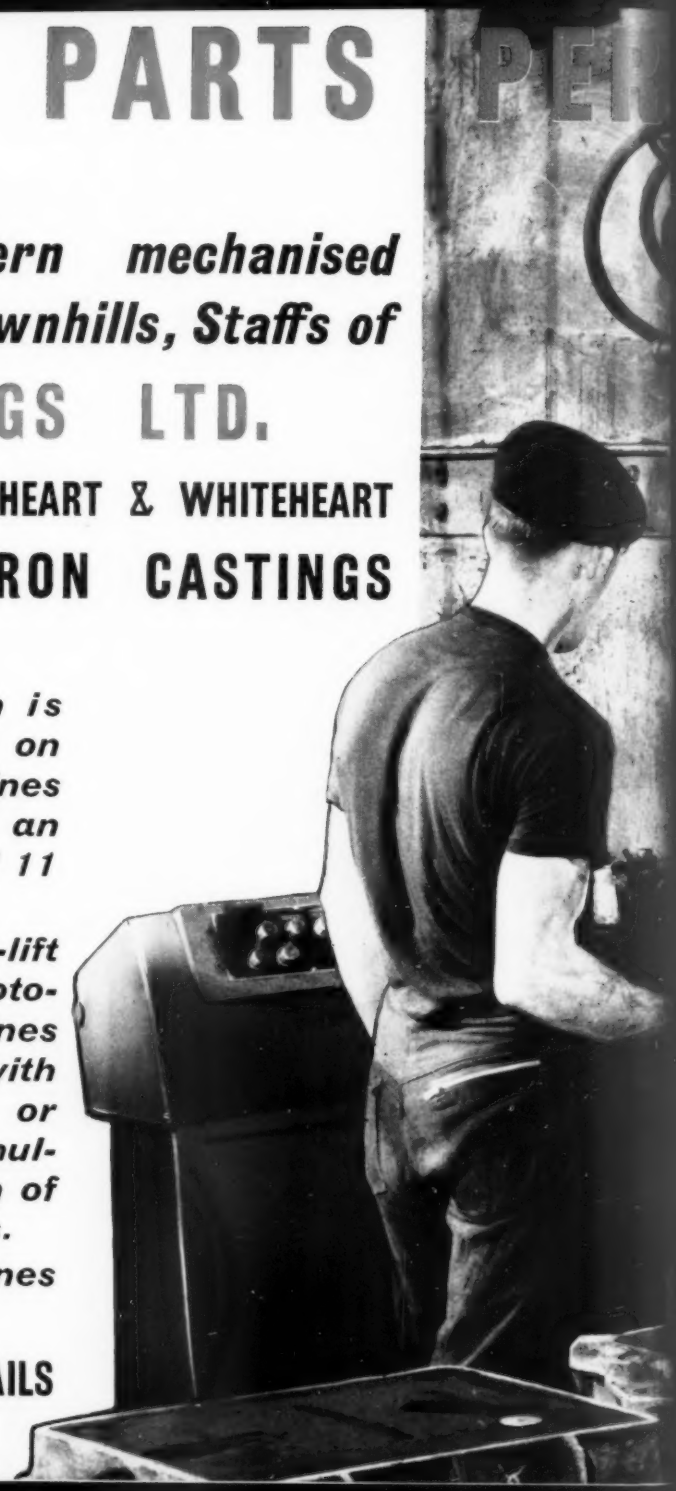

This production is being achieved on Type BQ1 Machines operating with an automatic cycle of 11 seconds.

In addition to Pin-lift as shown in photo-graph these machines are available with roller-lift, jaw-lift or "finger" lift for simul-taneous production of copes and drags.

BQ3 & BQ5 machines also available.

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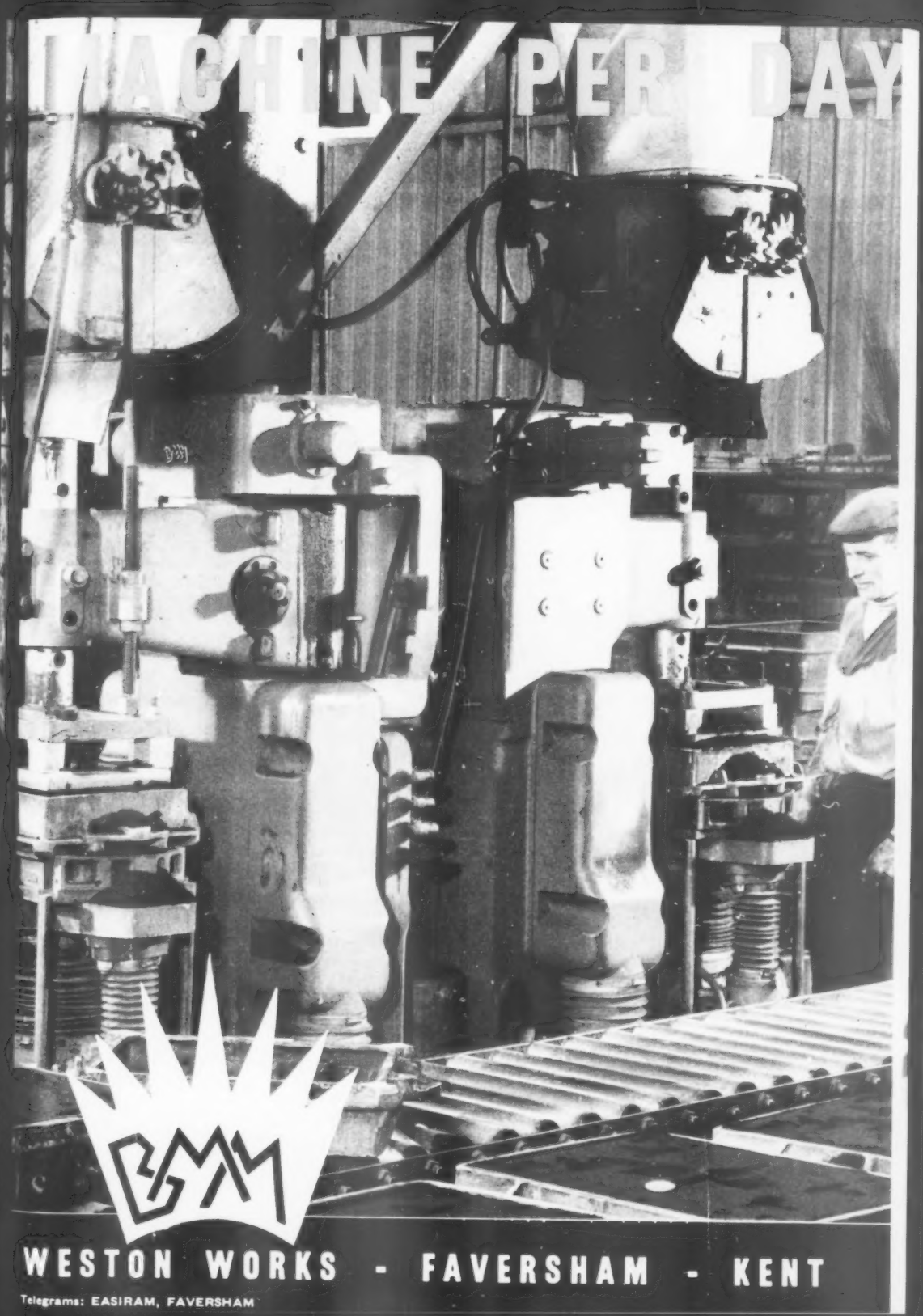
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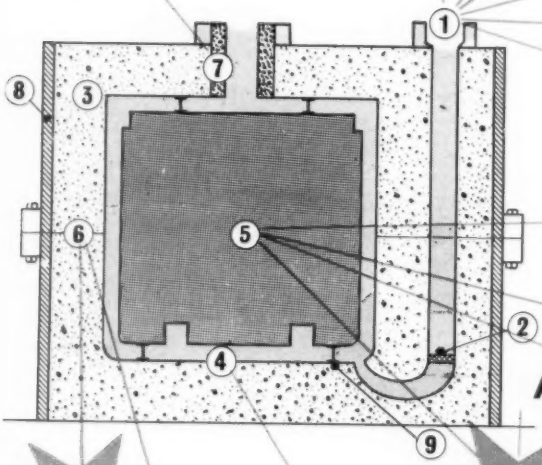

Key to Sectional Drawing of Mould

		Send or booklet No.
1	Metallurgical Control use of Fluxes	3
2	Clean Metal by using Ceramic Strainer Cores and Discs.	4
3	Coal Dust additional to Facing and Backing Sand	1
4	Silverskin Blackings, Plumbago and Mould Dressings.	1
5	Cores using Crulin and Crudol Core Binders (Oil Bonded, Air Setting Cereal or CO_2 Binders).	2
6	Moulds Parted with Beecro Silica Free Parting Powder or Beecrol Parting Liquid.	1
7	Casting Feeding with Alsica Exothermic Feeder Heads.	4
8	Moulding Boxes supplied by B.F.U.	5
9	Chaplets, Studs, etc.	

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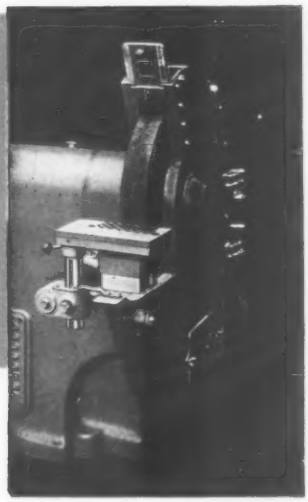
FOR IRON FOUNDRIES

Wheel hoods as developed by the British Cast Iron Research Association can be fitted

ALL COMPLYING WITH THE 1953 IRON & STEEL FOUNDRIES REGULATIONS

Luke & Spencer Ltd. manufacture a large range of pedestal and swing frame grinders with wheels from 12 inches to 36 inches diameter.



This 16 inch high speed swing frame grinder completely eliminates the dust problem. The dust is taken up at the point of suspension to ensure machine control and balance. It has been filmed in operation by the Factory Inspectorate and complies with all relevant regulations.

FOR STEEL FOUNDRIES

Wheel hoods as developed by the British Steel Castings Research Association can be fitted

Luke & Spencer Ltd.

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BMD

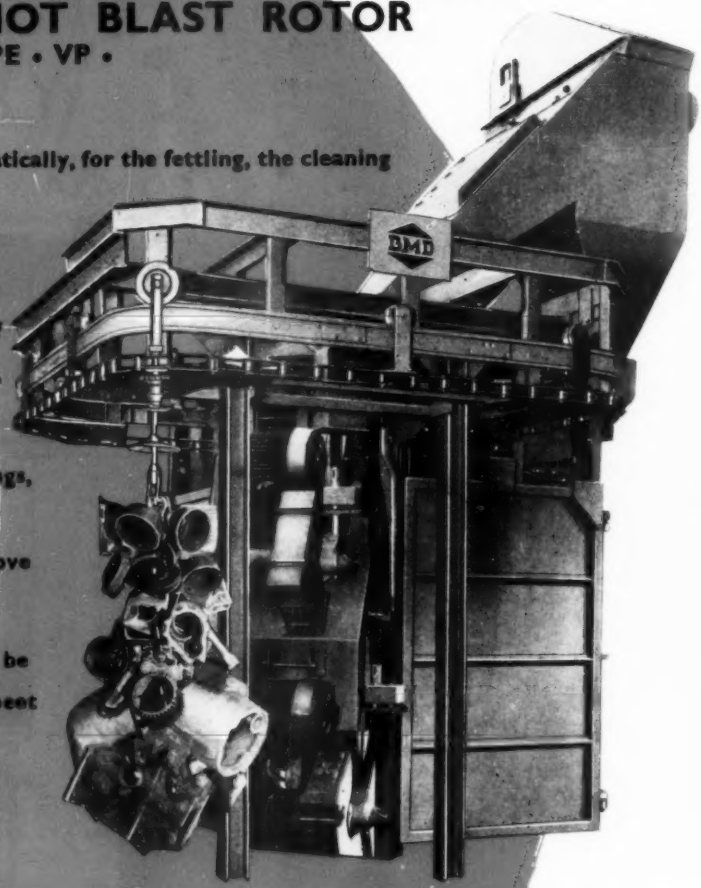
HEAVY DUTY MULTIPLE PURPOSE SHOT BLAST ROTOR

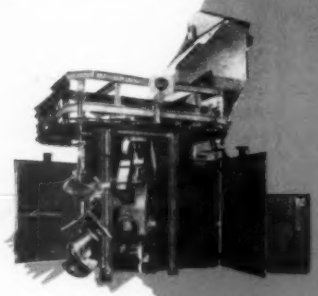
TYPE • VP •

operated entirely automatically, for the fettling, the cleaning and in special cases, the decoring of grey cast iron, cast steel or cast metal (up to 1000 kgs.) of various kinds and designs.

Furthermore it is suited for the descaling of forgings, hardened steel parts and for the pickling of stove or hearth castings.

The chain conveyor can be extended as desired, to meet the local requirements.





multiple purpose shot blast rotor with opened doors

We design and construct mechanical and automatic foundry plants and individual machines • sand conditioning plants • conveyor plants • moulding machines • slingers • automatic moulding units • SHOT BLAST ROTOR machines • hydraulic fettling plants cupolas • charging installations • dust arresting plants

Please write for leaflets, quotations and the advice of an engineer.

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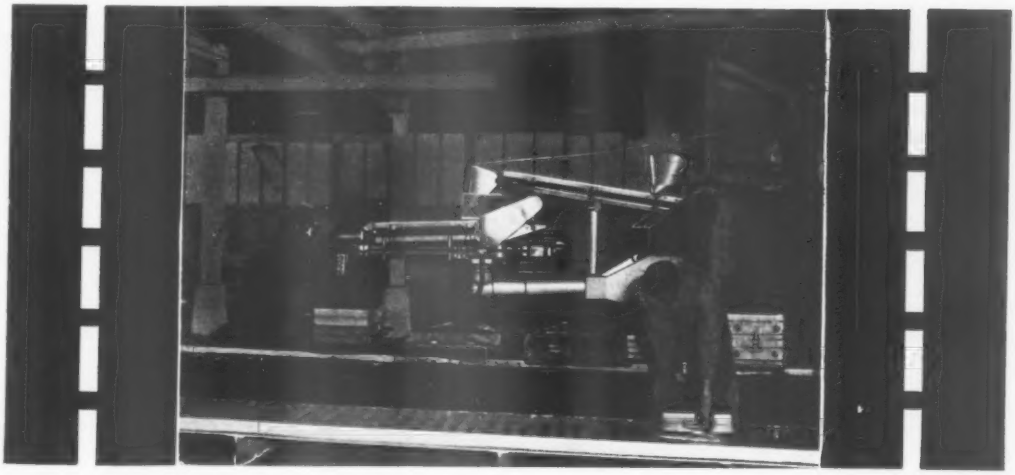
FOUMEC

One of our S.P.M.'s in production

ON JOBBING WORK—BUT UNDER A CONTINUOUS PROCESS!



The above photograph, appearing by the kind permission of The Alliance Foundry Co. Ltd., of Luton, Beds., shows one of our Sand Projection Machines No. 6, which has been installed and is now operating in their Foundry.

It is indeed a recommendation for our machines that this particular Foundry, one of the most modern and progressive in Southern England, catering for medium sized grey iron castings, should have selected our S.P.M. Machine to replace their previous sand ramming unit.

Why not follow their lead?

Send for details, or, for one of our technical representatives if you wish to discuss the installation of the S.P.M. in your factory.

We are at your service—Always.

FOUNDRY MECHANISATIONS (BAILLOT) LTD.

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The SHEFFIELD SMELTING
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ALSO AT LONDON AND BIRMINGHAM

IT'S RUDE TO POINT!

On the other hand we feel we must bring to your attention our facilities for producing both sand and machine cast high quality refined iron. Our scientific approach to customers' specifications ensures we "home on our target" every time, no matter how exacting our customers' requirements.

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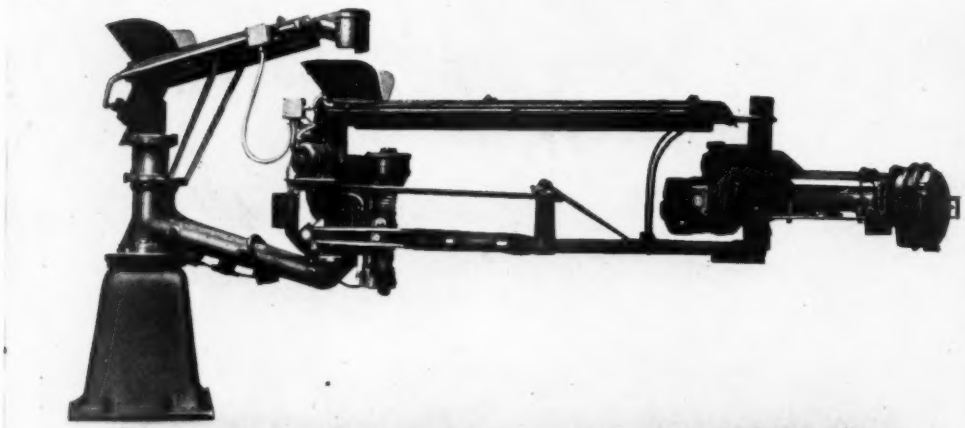
Sandslinger

AT DURGAPUR



We are privileged to have supplied the SANDSLINGERS to the Steel Works Foundry. Illustrated above is the 3 part arm Stationary Type Machine having raising and lowering arms.

FOUNDRY PLANT & MACHINERY LTD.

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Telephone: **SOUTH 2283**

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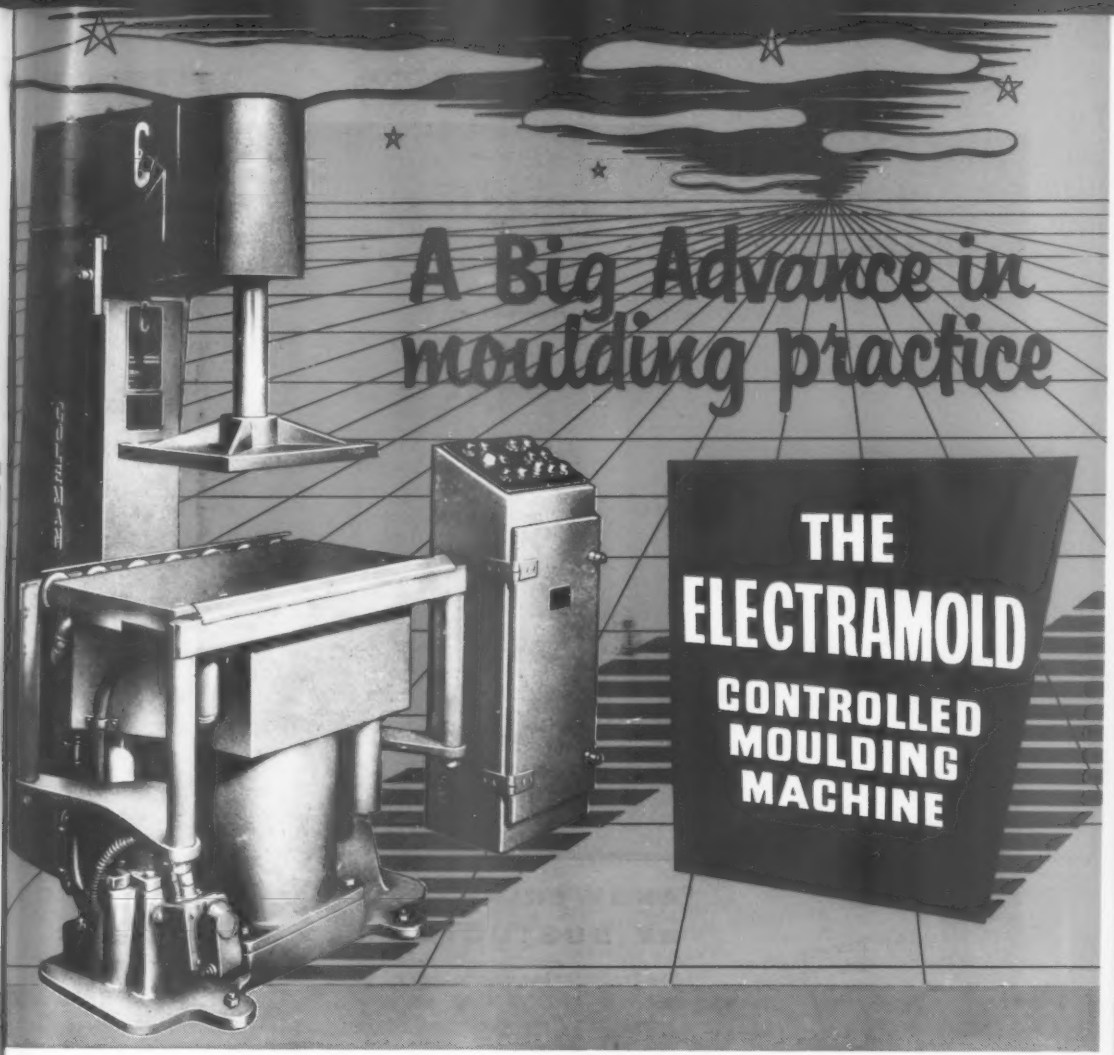

20 moulds per hour all of consistent quality

Compared with the normal hand-operated machine this *electronically* controlled moulding machine has distinct advantages. Each operation of the moulding cycle is performed in the exact, predetermined, optimum time, thus ensuring that all moulds are exact replicas of each other. This leads to a uniform, consistent quality of casting with a minimum of scrap. A considerably increased output rate is also ensured, 120 moulds per hour being well within the capacity of an effectively tended unit. *The quickly set controls make the ELECTRAMOLD equally suitable for long and short runs.*

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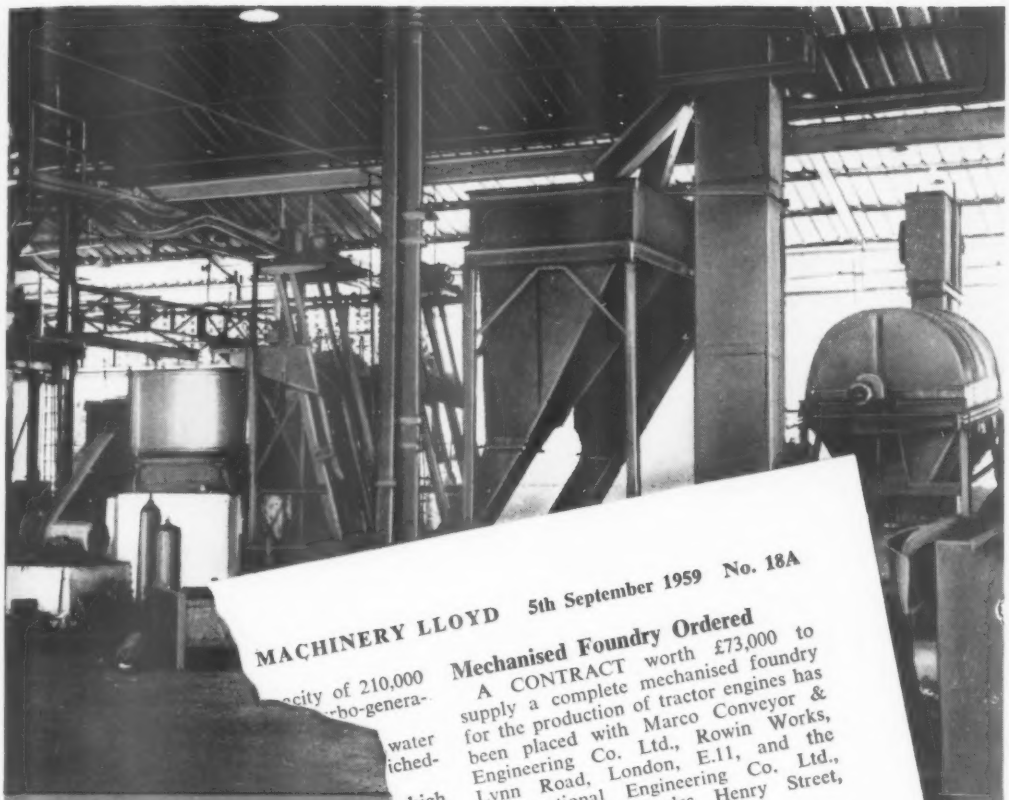

MACHINERY LLOYD 5th September 1959 No. 18A

Mechanised Foundry Ordered

A CONTRACT worth £73,000 to supply a complete mechanised foundry for the production of tractor engines has been placed with Marco Conveyor & Engineering Co. Ltd., Rowin Works, Lynn Road, London, E.11, and the Constructional Engineering Co. Ltd., Titan Works, Charles Henry Street, Birmingham 12, England.

The British firms beat strong competition from local and other foreign firms in winning the order. Most of the equipment will be built in Britain, except for parts of the steelwork, which will be fabricated locally.

As reported in many previous issues, Industrija Motora, Rakovica, nr. Belgrade, have been importing large quantities of diesel engines from F. Perkins Ltd., Peterborough, Northants., and also have an agreement to make the engines themselves under licence, for incorporation in Ferguson tractors (Massey-Ferguson, Eastern Hemisphere Division, Coventry) and in locally-developed Zadrugar tractors.

Illustration of plant supplied to Hindustan Motors Ltd., India

ONE OF THE LARGEST DESIGNERS AND MANUFACTURERS OF FOUNDRY EQUIPMENT IN GREAT BRITAIN

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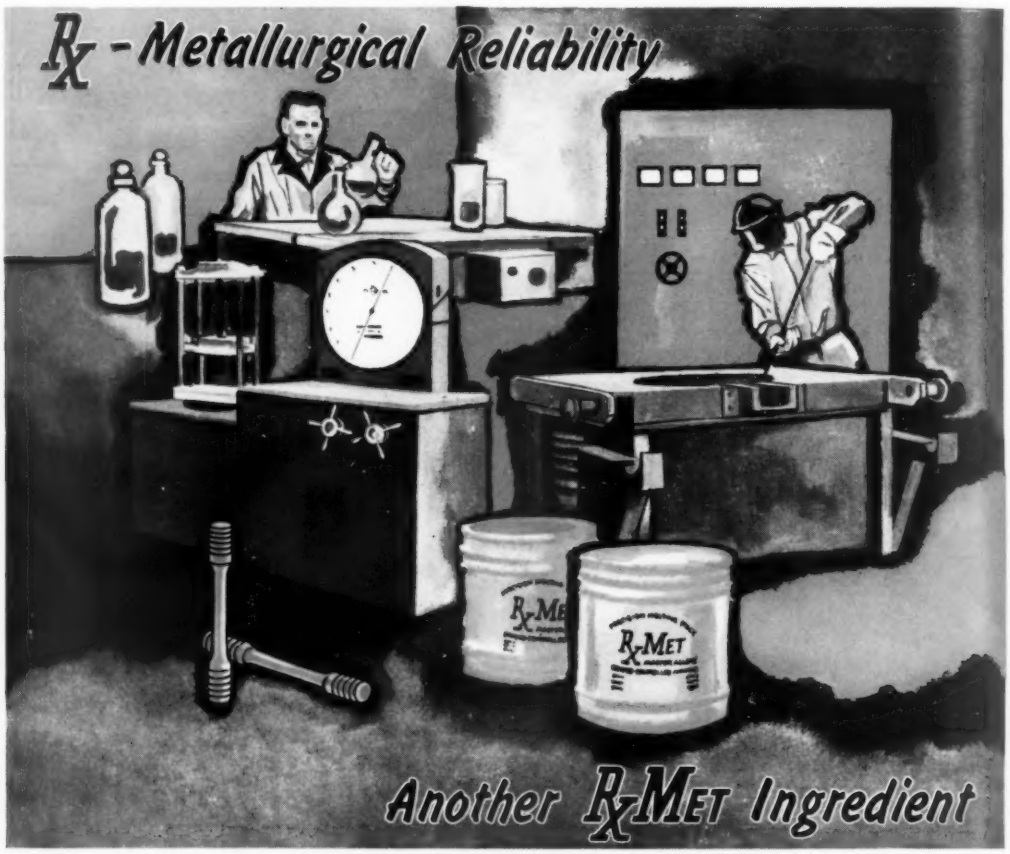
Agents throughout the United Kingdom



METALLURGICAL RELIABILITY, a function of man and his control of materials and machines. Here at WAIMET we have little that is unique in the world except our dedication to metallurgical science and our unusual ability to tailor alloys to particular end uses. Every day we forge another little wedge, add another small contribution to the knowledge of how metals behave. Here are three alloy improvements that are currently aiding users of high temperature alloys:

17-4 PH

Research, in the field and at home, was the key to improving the reproducibility of 17-4 PH castings. The work of the WAIMET technical team resulted in new guaranteed properties and better knowledge of heat treating requirements.

SUPER 3 and 6

Users of cast abrasion-resistant alloys now have the price advantage (up to 40% lower alloy cost) of WAIMET's new chrome-cobalt-tungsten alloys, SUPER 3 and SUPER 6.

WI-52

In eighteen months of intensive effort, WAIMET brought a promising alloy from its state of marginal reliability up to a degree of reproducible performance not anticipated in the original alloy development.

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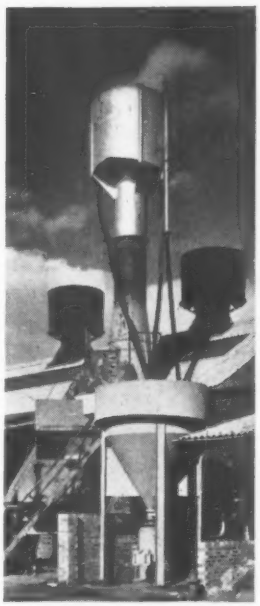
Do you have alloy casting problems, or casting application problems? Perhaps one of these three outstanding alloys - or others of the ℞MET® family of high performance alloys will solve your need. Write us for more information.

DUST...

Coarse as grit . . . fine as fume; if you want to control it, collect it, separate it, extract it, the people to get in touch with are Filter-Heat Ltd.

WHY?

For a very sound reason. They are not committed to any particular *method* of dust collection but are concerned with one thing only—the best way to trap a particular type of particle. It might be done with cyclones or multi-cyclones, cloth filters, wet collectors or reverse-jet filters —or a combination of these. Filter-Heat make them all. But for cupola emission they would install their water screen grit and spark arrester, similar to the one illustrated which is shown complete with its specially designed settling tank. They have also considerable experience in the design of hoods for the control and collection of industrial fumes, dust and grit. If you have a dust or grit problem ring them up—at Rugeley 138; Leigh, Lancs 94, or (London) Abbey 3085. The name is...



The Filter-Heat water screen grit and spark arrester was operating when the photograph was taken. As you can see against the background of blue sky only steam is escaping.

FILTER-HEAT LTD

(a subsidiary of Sutcliffe, Speakman & Co. Ltd.)

33 MARKET SQUARE, RUGELEY, STAFFS.

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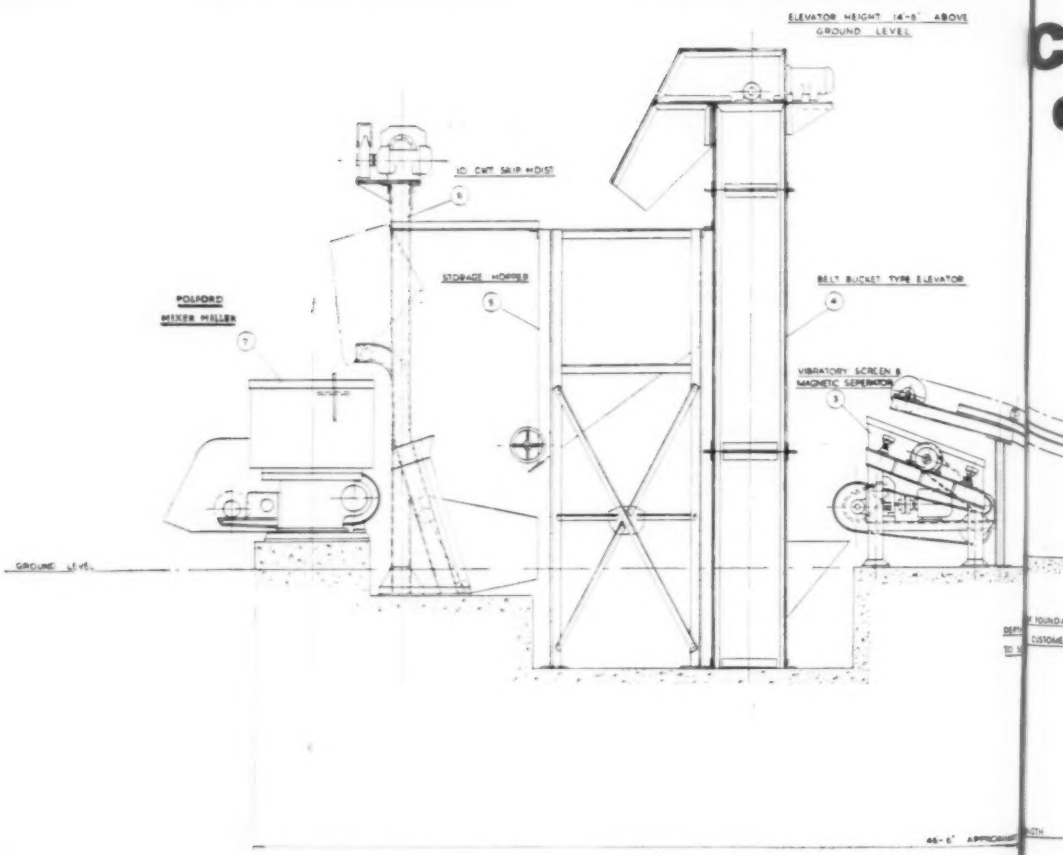

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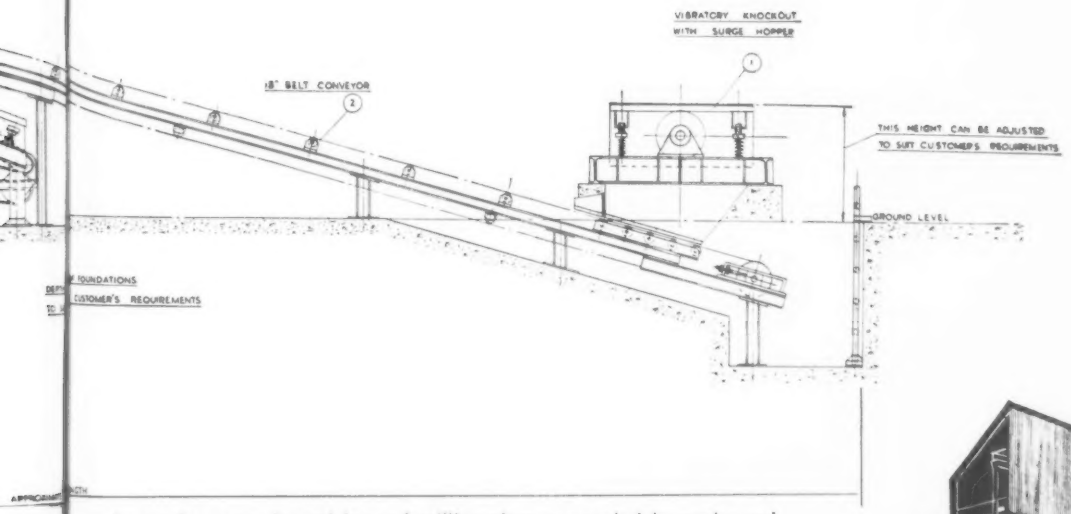

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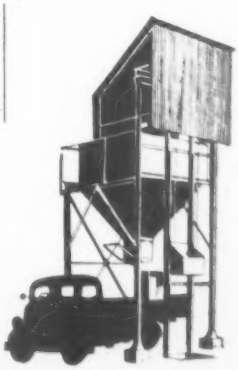

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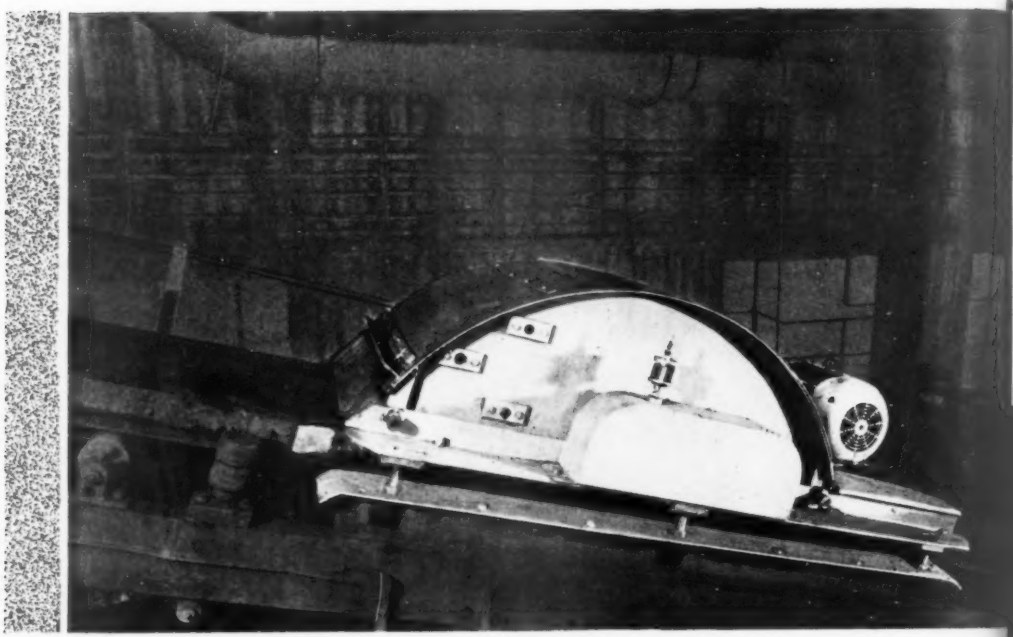

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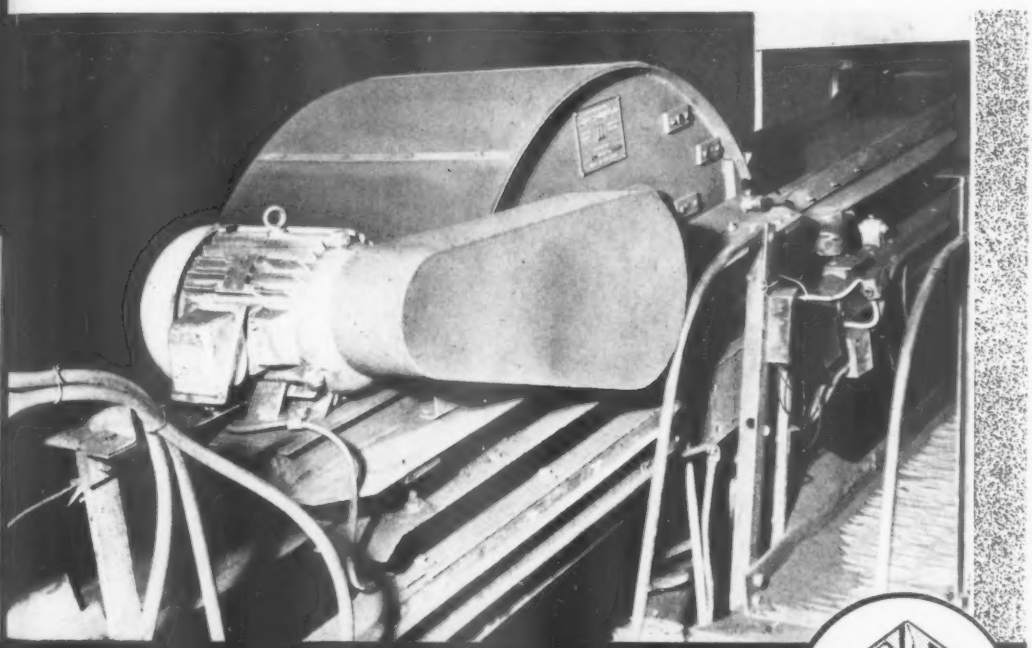

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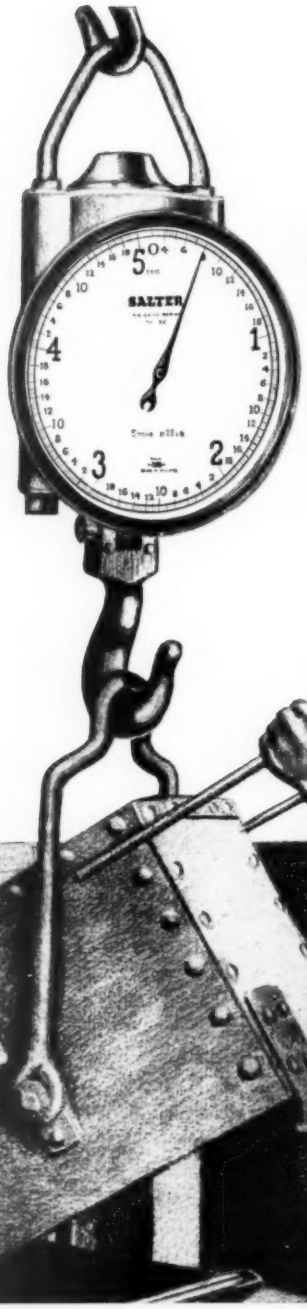

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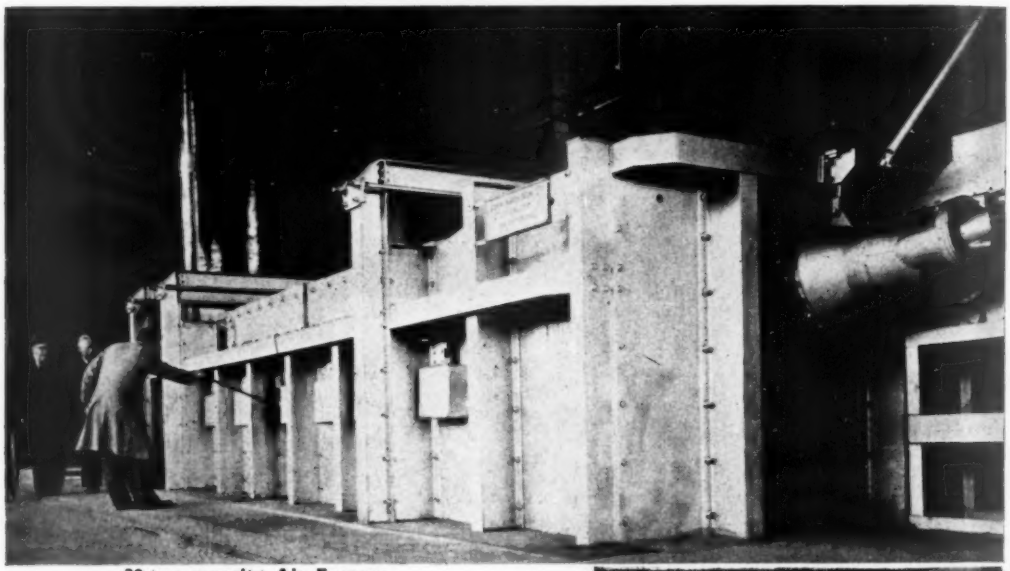

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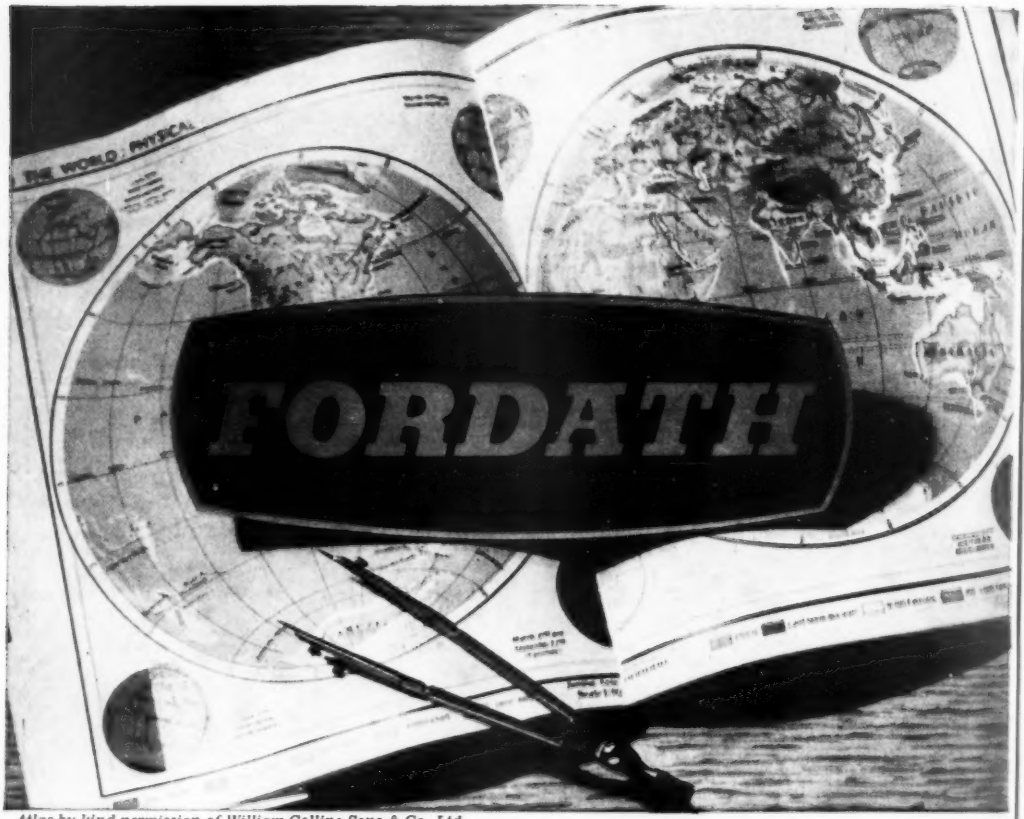

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PRINCIPAL CONTENTS

PAGE

Foundry Goggles

Third report (and technical sub-committee report) of the Joint Advisory Committee organized under the auspices of the Ministry of Labour (through H.M. Factory Inspectorate) and including representatives of goggle producers and users 288

Fish in Cast Iron

By C. J. Robb 297

South African Exposition

By John Steele

Description of foundry participation in the Union's £10,000,000 show at Johannesburg 299

Fencing of Dangerous Machinery . . . Does it extend to Overhead Cableways?

By "Barrister-at-Law" 301

Lunettes de Protection
Troisième rapport (et rapport du sous-comité technique) du Joint Advisory Committee, organisé sous le patronage du Ministère du Travail (par l'intermédiaire de l'inspecteur en chef des usines), des représentants des fabricants de lunettes de protection et de ceux qui les utilisent 288

Exposition sud-Africaine. Par John Steele.
Description de la partie occupée par la fonderie, à l'exposition tenue à Johannesburg, organisée par l'Union Sud-africaine, et coûtant dix millions de livres sterling 299

Schutzbrillen für die Giesserei.
Dritter Bericht (zugleich Bericht des technischen Unterausschusses) des gemeinsamen Beratungsausschusses, der unter der Leitung des Arbeitsministeriums stand und von Vertretern der Gewerbebehörde und Erzeugern und Benützern von Schutzbrillen beschickt war 288

Die südafrikanische Ausstellung. Von John Steele.
Eine Schilderung der Teilnahme der Giessereien an der 10 Millionen Pfund kostenden Schau der Südafrikanischen Union in Johannisburg 299

Features, News, Commercial Information and Statistics

Leader: Co-operation for Safety 287
Polish Foundry Abstracts 297
Company News 298
Progress at Durgapur 300
Death of Mr. Barrington Hooper, C.B.E. 303
Prominent SA Foundryman visits AEI 304
Institute of Vitreous Enamellers' Conference 304
News from South Africa 305
American Letter 306
Equipment and Supplies 307
Head, Wrightson to supply Cooling Towers for Mexico 307
Personal 308
News in Brief 310
Raw Material Markets 314
Current Prices of Iron, Steel and Non-ferrous Metals 316
Imports and Exports of Iron and Steel in July 318

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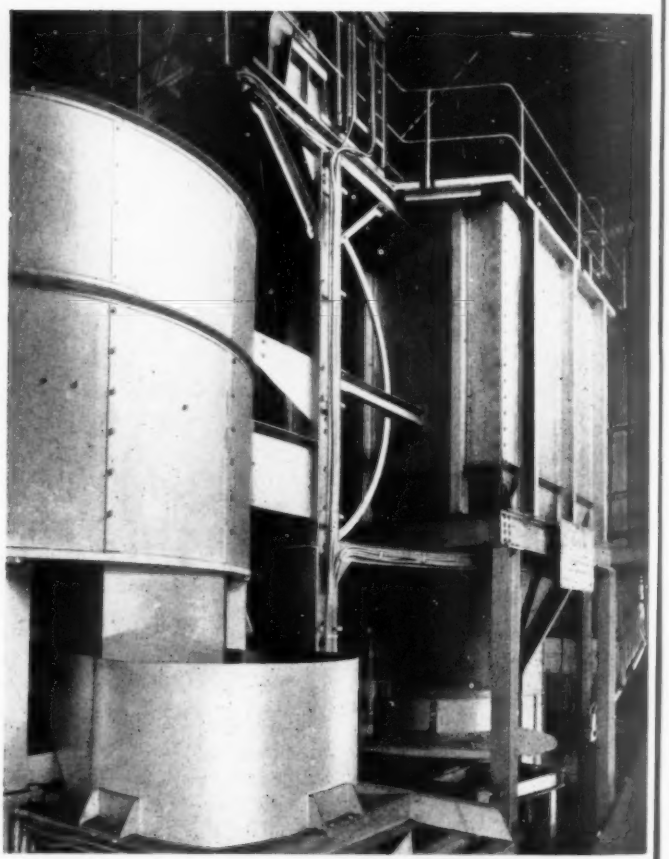

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FOUNDRY
TRADE JOURNAL

Vol. 109 September 8, 1960 No. 2283

Co-operation for Safety

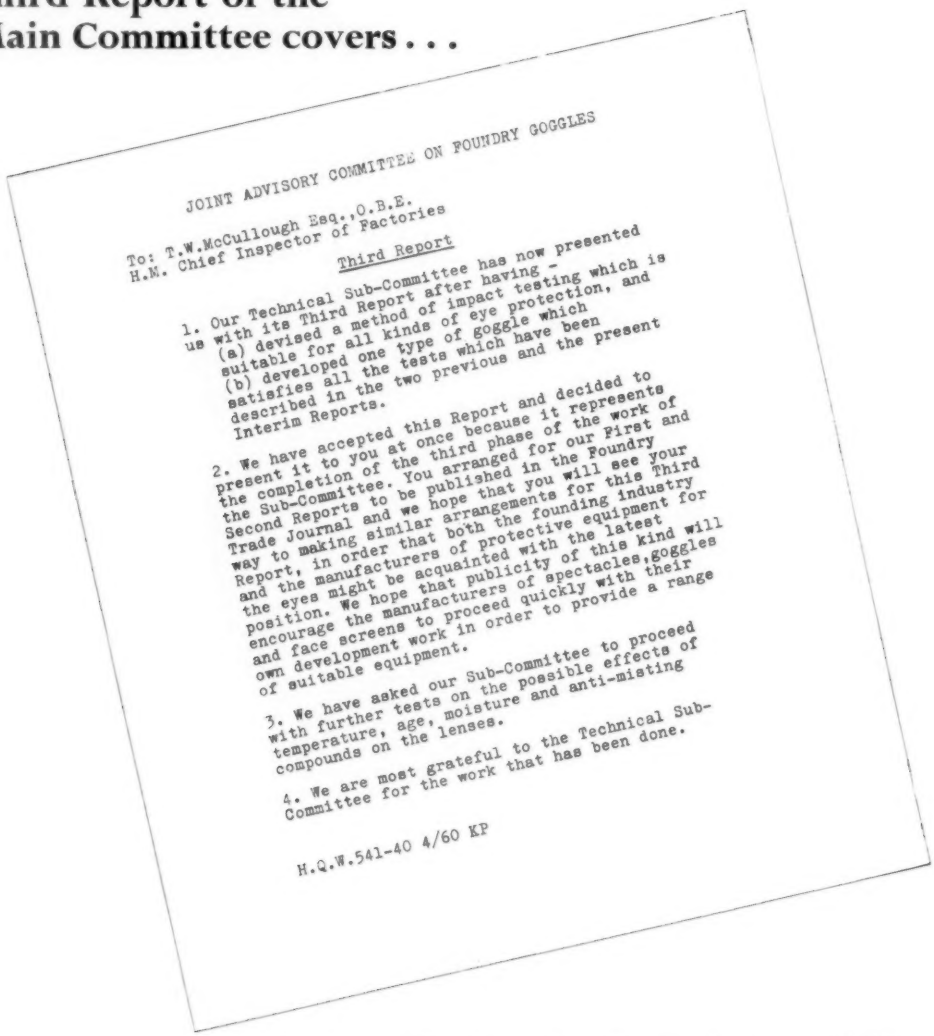
There was a time when British industry was opposed to any regulations set up under the Factory Acts, as it was often erroneously presumed that the cost of their implementation would impair UK competitive potential in overseas markets. No doubt this was quite true in certain cases, but not so in others, as for example the Grinding of Metals Regulations. Here, the enforcement of such rules brought about the introduction of new and better machines and layouts in many fettling shops, which resulted in a general lowering of costs, in addition to the institution of healthier working conditions. Since that time, there has been much cordial co-operation between the foundry industry and the Factory Inspectorate. Before new regulations are imposed, joint committees are set up to study all possible aspects of the problems involved.

Such has been the case in the search for a reliable and practical goggle, capable of withstanding the onerous conditions encountered in foundry workshops. To date, three reports have been completed and submitted to the Chief Factory Inspector, the last of these being printed in this issue.* Any regulations as to safety goggles that may be made in the future will at least carry the assurance that they are backed by a wealth of technical data. There is no claim in this third report that finality has been reached, for only prolonged workshop use can show the influence of ageing, whilst misting constitutes a problem difficult of solution. The subject of eye-protection is well worth pursuing not only for the humanitarian point of view, but also from the aspect of the cost of compensation which, rightly, runs high when awards are made for eye injuries.

In industrial safety-precautions, this country leads the world and the incidence of accidents when considered from an international standpoint is commendably low. Moreover, year by year the situation has been ameliorated and whilst there is no room for complacency, there is ground for continued co-operation by everybody concerned. Only too often are there reports of accidents to personnel who neglect to use the safety equipment provided and this aspect, too, must receive continuous attention and propaganda to encourage operators to use the devices provided. Probably unique in the world's fight to reduce industrial accidents is this present example of goggle design, where a Government department has co-operated with the representatives of industrialists and trade unions for the express purpose of developing an appliance and carrying out extensive fundamental research to aid a joint committee in long-term investigations. In the case of goggles, the findings which have been recorded are of a really worthwhile character.

* See pages 288 to 297.

Third Report of the Main Committee covers . . .



JOINT ADVISORY COMMITTEE ON FOUNDRY GOGGLES

To: T.W.McCullough Esq.,O.B.E.
H.M. Chief Inspector of Factories

Third Report

1. Our Technical Sub-Committee has now presented us with its Third Report after having -
(a) devised a method of impact testing which is suitable for all kinds of eye protection, and
(b) developed one type of goggle which satisfies all the tests which have been described in the two previous and the present Interim Reports.

2. We have accepted this Report and decided to present it to you at once because it represents the completion of the third phase of the work of the Sub-Committee. You arranged for our First and Second Reports to be published in the Foundry Trade Journal and we hope that you will see your way to making similar arrangements for this Third Report, in order that both the founding industry and the manufacturers of protective equipment for the eyes might be acquainted with the lateat position. We hope that publicity of this kind will encourage the manufacturers of spectacles,goggles and face screens to proceed quickly with their own development work in order to provide a range of suitable equipment.

3. We have asked our Sub-Committee to proceed with further tests on the possible effects of temperature, age, moisture and anti-misting compounds on the lenses.

4. We are most grateful to the Technical Sub-Committee for the work that has been done.

H.Q.W.541-40 4/60 KP

. . . recommendations to Suppliers and Users

* * * * * * * * * *

Above is a facsimile of the Goggle Committee's Main Report. It was signed by all the members, namely, Mr. H. Woods (HM Deputy Chief Inspector of Factories) chairman, Mr. R. Berry (representing British Standards Institution), Mr. F. Bullock (Amalgamted Union of Foundry Workers), Mr. A. W. Bushell (Council of Ironfoundry Associations), Professor G. P. Crowden, O.B.E. (London School of Hygiene and Tropical Medicine), Mr. J. Gardner (Amalgamated Union of Foundry Workers), Mr. J. Higham (National Union of Stove, Grate, and General Metal Workers), Mr. W. B. Lawrie, M.B.E. (HM Engineering Inspector of Factories), Dr. S. C. Rainsford (HM Medical Inspector of Factories), Mr. H. V. Shelton (National Light Casting Iron Founders' Federation), Dr. A. H. Sully (British Steel Castings Research Association), Mr. T. H. Swinden (Engineering and Allied Employers' National Federation) and Mr. H. C. Weston, O.B.E. (Institute of Ophthalmology).

Foundry Goggles

Third Report of the Sub-committee* of the Joint Advisory Committee

The JOURNAL was privileged to publish the First and Second Reports of the Joint Committee on Foundry Goggles and these pages now carry the subject further with the Third Report and the sub-committee's detailed researches. The Committee was set up some years ago by the Government and included representatives of the Ministry of Labour—acting through the Factory Inspectorate—the goggle manufacturers and the foundry industry, employers and employed (as detailed on the preceding page). The work is still incomplete, but a stage has been reached at which field tests will be valuable, in co-operation with manufacturers, on developments to date. Subjects are outlined for future research on several aspects.

Earlier Reports

Addressing Mr. H. Woods, chairman of the Joint Advisory Committee on Foundry Goggles, the sub-committee begin their report as follows:

We have now reached the end of the third stage of the work that was remitted to us by the Joint Advisory Committee on Foundry Goggles and so are offering you a Third Report. As a matter of convenience, we quote here our previous conclusions. At the end of the first stage of our work, we embodied our conclusions in our First Report† which read as follow:—The work has not yet been completed, but sufficient has been done to lead us to certain definite conclusions:—

(*a*) Toughened glass should not be used as protection against molten metal nor should it be used to protect against flying particles in foundries.

(*b*) Laminated glass is always broken by the molten metal and often by flying particles. In some cases, splinters fly off from the surface of the laminated glass that would be adjacent to the wearers' eyes. It could not be said that laminated glass is useless, but those of us who have seen the experimental work would not be comfortable again in using this material. We hold the view therefore that laminated glass should not be used in foundries.

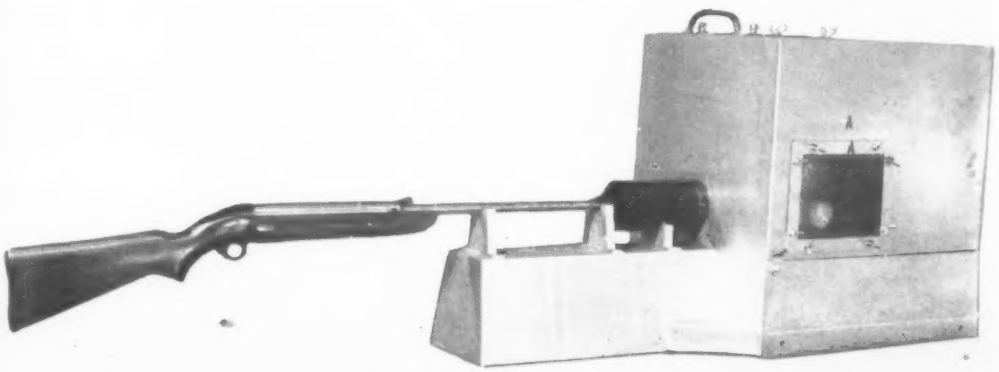
(*c*) Plastics are greatly superior to glass in resisting penetration by molten metal. Much more work needs to be done in order to determine the suitability of the various plastics for use as goggles, but there can be no doubt that suitably-designed plastic goggles are infinitely better than glass goggles in resisting penetration either by molten metal or by flying fragments.

(*d*) The tests available show that a laminated-plastic goggle was by far the best so far as physical protection is concerned. Many more aspects of the matter will have to be considered and much

* The technical sub-committee comprised two members: Mr. A. W. Bushell (Midland Motor Cylinder Company, Limited), and Mr. W. B. Lawrie, M.B.E., M.Sc., F.R.M.S., A.I.M. (Factory Inspectorate, Ministry of Labour).

† The first and second reports were published in the JOURNALS of March 6, March 20 and April 3, 1958, and May 21, 1959, respectively.

FIG. 1.—*General arrangement of the impact-test rig, showing the rifle in position, as in the actual test.*



more work will have to be done, but the experimental work to date indicates quite clearly that the laminated-plastic goggle is the one that provides the maximum degree of safety.

(*e*) Molten metal does not appear to wet plastic surfaces, but it does wet metal surfaces and glass surfaces and adheres to them. It appears at this stage therefore that plastic lenses should not be mounted in metal rims because molten splashes will adhere to the rim and may then set fire to the plastic. This aspect of the matter clearly needs further consideration and probably further experimental work.

At the end of the second stage of our work, we embodied our conclusions in our Second Report† which read as follow:—

(1) The conclusions reached in our First Report were confirmed and amplified.

(2) Impact tests can be done with cold solid projectiles so long as the effects of heat are estimated by means of other tests.

(3) Impact testing should be done at a velocity at least as high as 20,000 ft. per min.

(4) All toughened and laminated-glass lenses completely failed the impact test, and were also cracked and broken when tested against molten projectiles. They are therefore unsuitable for use in foundries.

(5) Certain laminated-plastic lenses and certain double-plastic lenses withstood the impact test and were also satisfactory against heat tests. Other types of plastic lenses may well be developed in the future, but we have no doubt now that existing and easily available plastic materials will give complete protection against the fairly severe tests that we have applied. We take the view therefore that lenses of these types are suitable for use in foundries.

(6) These plastic lenses will have to be securely mounted in suitable frames and the testing of complete goggles and spectacles is therefore the next stage of our work.

(7) The ophthalmological properties of the selected lenses must now be investigated and work has already started on this aspect of the matter.

These conclusions have remained unchanged by our subsequent work which has merely served to amplify and confirm them in so far as it has borne on them at all. This Third Report deals chiefly, however, with the development of frames which would be strong enough to hold the lenses against the impact test, on which basis the lenses themselves have already been selected.

Preliminary Considerations

When we drafted our Second Report on the completion of the second stage of our work we had:—(*a*) Designed, constructed, calibrated and used a spring-loaded test machine with cold solid projectiles, hot solid projectiles and molten-metal projectiles striking the lenses under test at velocities of 7 to 10 ft. per sec.; (*b*) designed, constructed, calibrated and used a test rig with cold solid projectiles striking the lenses under test at velocities of 390 ft. per sec. (approximately 266 miles per hour); (*c*) examined the work of Major Reid who had designed, constructed, calibrated and used a rig with cold solid projectiles striking the lenses under test at velocities of 700 to 900 ft. per sec. (approximately 477 to 613 miles per hour);

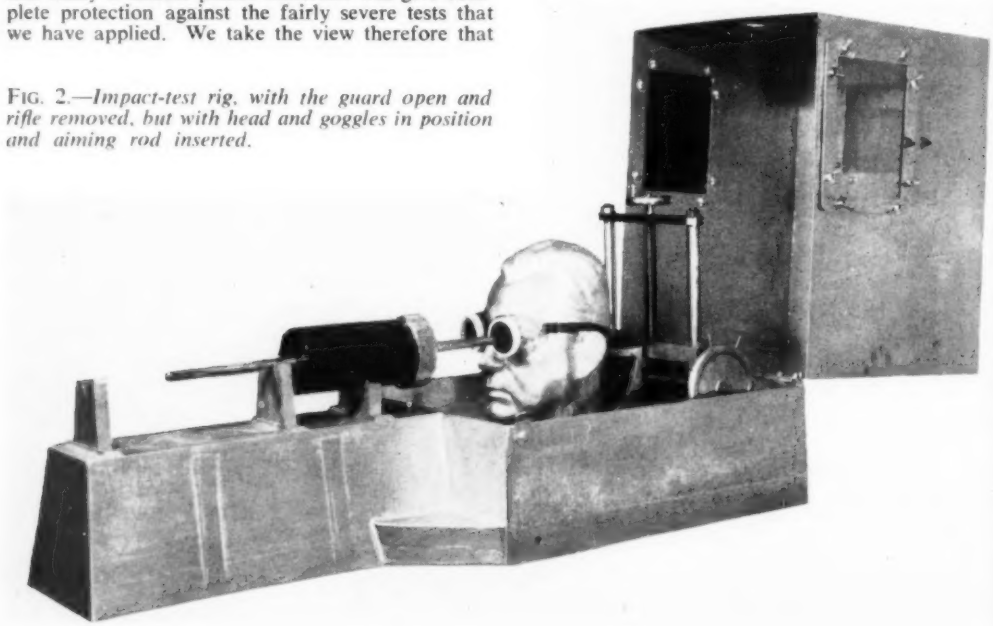


FIG. 2.—*Impact-test rig, with the guard open and rifle removed, but with head and goggles in position and aiming rod inserted.*

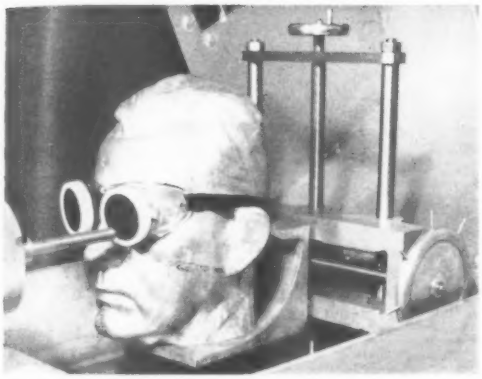


FIG. 3.—*Close-up of the head—wearing goggles—in the test-rig, with the sighting rod in position. Also shown are the mechanisms for moving the head vertically or horizontally.*

(*d*) designed, constructed, calibrated and used a needle-penetration test-machine, and (*e*) designed, constructed and used an empirical rig by means of which burning tests could be applied to plastic lenses.

These tests had led us to the conclusion that glass should not be used for protection against molten metal, neither should it be used to protect against flying particles which might easily possess large amounts of energy. We had also developed several double-plastic lenses which withstood all our tests. Finally, we had been informed that there was good reason to believe that these double-plastic lenses would satisfy the British Standard ophthalmological requirements. Two things therefore remained to be done, i.e., (*a*) to modify the test equipment so that complete spectacles, goggles or face shields could be tested, and (*b*) to design spectacles, goggles or face shields which would withstand the tests.

Impact

Rig

We used the air rifle described in our Second Report, modifying the rig to take a head on which all types of protective equipment could be mounted. The orbits were machined out so that plasticine could be inserted before testing. This would indicate whether or not the "eye" had been struck by the missile or by any part of a broken goggle after testing. The arrangement is shown in Figs. 1 to 4. Fig. 1 shows the rig as it is actually used for testing. Fig. 2 shows the guard open after the rifle has been removed. A pair of goggles is mounted on the head and a rod has been inserted through the rifle-muzzle locating-cylinder. This rod points to the spot on which the missile will strike the goggle when testing. It is used therefore to "sight" the rifle so that any part of the goggle can be tested. Fig. 3 is a close-up view of the head and the end of the rod, this illustration also shows the screws and wheels by means of which the head is moved either horizontally or vertically so that the point of impact of the missile can be selected. Fig. 4 shows a line drawing of the apparatus.

During the second stage of our work, we had mounted the lenses rigidly between steel retaining-rings when they were being tested. This was done because the object at that stage was to test the materials of which the lenses were made. It was important therefore that no movement of the lens be allowed at the moment of impact. Had this occurred, the results would not have indicated the behaviour of the material under test, but the combined resistance due to the material and the movement. It would not then have been possible to separate the two factors. It may be unlikely that any such movement would have had much

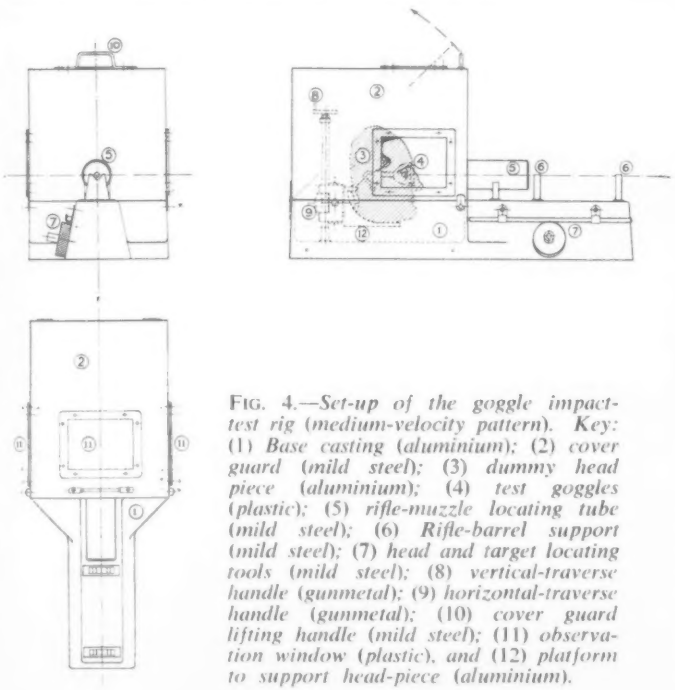


FIG. 4.—*Set-up of the goggle impact-test rig (medium-velocity pattern). Key:* (1) *Base casting (aluminium);* (2) *cover guard (mild steel);* (3) *dummy head piece (aluminium);* (4) *test goggles (plastic);* (5) *rifle-muzzle locating tube (mild steel);* (6) *Rifle-barrel support (mild steel);* (7) *head and target locating tools (mild steel);* (8) *vertical-traverse handle (gunmetal);* (9) *horizontal-traverse handle (gunmetal);* (10) *cover guard lifting handle (mild steel);* (11) *observation window (plastic), and* (12) *platform to support head-piece (aluminium).*

Goggle Sub-committee Report

effect at an impact velocity of 390 ft. per sec., but nevertheless mechanical tests on the strength of materials should not include two unknown factors.

For the part of the work described in this Report, we decided that the goggles should be tested in conditions as near as possible to those in which they would be used. This decision was made because we already knew that the lens material was strong enough to withstand the impact test. We were no longer testing the strength of a material, but the resultant of material strength, constructional strength, resilience due to design, movement on impact and so on. We hold the view that both types of impact test should always be done so that material will not be used for the protection of eyes unless it is strong enough to resist the impact when mounted rigidly and that goggles (or other eye protection) will not be used unless they are of such design and construction that they will resist the impact when mounted " as worn."

Tests

We discovered four suitable lenses as a result of our earlier work, but we emphasized at the time that these lenses may not be the only materials which are satisfactory for the purpose, adding the comment that " there may be other materials which we have not tested or of which we are not aware which may give equal or better results." We did not however think that it was any part of our work to explore the whole range of possible materials once we had found materials and lenses which would provide the kind of protection we envisaged in our First Report. We have treated the third phase of our work in the same manner and, in consequence, we used only one of the four types of lenses known to be suitable on previous impact tests because goggle frames which would hold this type of lens against the tests could presumably be made to hold other types of lenses as well. We also thought that our work would be completed if we could develop one form of eye protection that would satisfy all our tests, leaving to the industry concerned the development of other and perhaps better forms. We decided therefore that we should try to find one such form of spectacle, one such form of goggle and one such form of face screen. We have not found a suitable pair of spectacles, but have developed a face screen which looks exceedingly promising and have also developed one form of goggles which will satisfy all our tests. This is not to say that other forms of eye-protection might not be made which would be as good or even better—we hope such developments will follow. However, we now have one form of goggles which meet the tests applied and because those tests are so far in excess of

TABLE 1.—*Impact Tests on Spectacles.*

Serial Number.	Eye-protection.	Position of shot.	Remarks.
1	Metal-frame spectacles	One shot in centre of lens	Lens undamaged, but knocked out of frame
2	,, ,,	One shot on spectacle bridge	Frame distorted; right lens knocked back; left lens moved forward; neither lens left frame
3	Metal-frame spectacles, with side protection	One shot in centre of lens	No damage
4	,, ,,	One shot near bridge	Lens undamaged, but driven out of frame
5	,, ,,	One shot near hinge of side piece	Lens driven out of frame (lens undamaged)
19	Model 501 — acetate frame and acrilic lens	One shot in centre of lens	Lens broken and shot penetrated
20	,, ,,	One shot on hinge of side piece	Spectacles knocked off head; no damage beyond slight crack in acetate frame on back
21	,, ,,	One shot on bridge	Bridge broken; spectacles fell off head in two pieces

TABLE 2.—*Impact Tests on Face Screens.*

Serial Number	Eye-protection.	Position of shot.	Remarks.
33*	Curved double screen ("Celestoid," 0,050 in. thick front and 0,080 in. thick back)	One shot on centre line over bridge of nose	No damage
34*	,, ,,	One shot on same place as for Test 33 and on same screen	The impacted sheet (0,050 in.) cracked and the back sheet (0,080 in. thick) broke—a piece being dislodged from the screen. The ball did not penetrate
50	Flat double screen ("Celestoid" 0,050 in. thick front and 0,080 in. thick back)	Shot No. 1 (Fig. 5)	No damage
51	,, ,,	Shot No. 2 (Fig. 5)	No damage
52	,, ,,	Shot No. 3 (Fig. 5)	No damage
53	,, ,,	Shot No. 4 (Fig. 5)	No damage
54	,, ,,	Shot No. 5 (Fig. 5)	Front lens penetrated, probably because of $\frac{1}{4}$ in. air-gap between front and back
55	,, ,,	Shot No. 6 (Fig. 5)	Front layer broken off below point of impact
56	,, ,,	Shot No. 7 (Fig. 5)	Both back and front layers broken and penetrated, probably because of $\frac{1}{4}$-in. air-gap

* Other shots were tried in different positions on the same screen. All results were similar, the screen failing in the same way, on the second or third shot.

anything previously used in industry, think that the greatly superior form of eye protection now available should be used as a minimum.

Results

Spectacles.—A few spectacles were tested, but these all failed for one reason or another and we have insufficient information to warrant any real discussion of the matter. We included details of some tests (Table 1) as an indication of the sort of results we obtained.

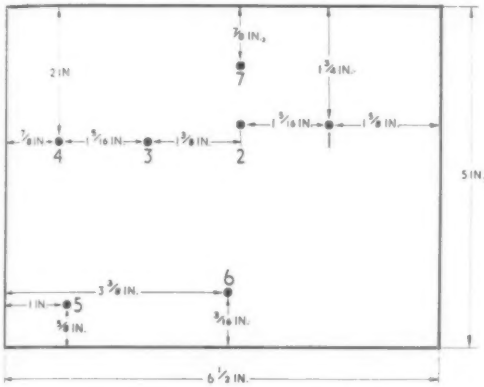


FIG. 5.—*Diagrammatic representation of the face screen tested, showing the positions receiving the impact of shot.*

Face Screens.—Two types of face screen were tested, both being made of "Celastoid" and consisting of two layers, the front layer being 0.050-in. thick and the back layer 0.080-in. thick. The two layers were not stuck together in any way, and so we called them "double screens," to distinguish them from a true laminated screen in which the layers would be held together by an adhesive. The difference between the two screens was that the first one was curved in the normal manner whilst the second one had a flat front which was bent through 90 deg. at each side in order to give two flat side-wings.

The curved screen was used for the first series of tests (numbers 33 to 34 Table 2, and footnote). Although the curved screen resisted the first shot of each test, it failed on the second or third shot when a series of shots were fired at the same spot on the screen one after the other. It was known from earlier work that a double lens of this material in these thicknesses would not fail in this fashion even when it was mounted rigidly. We had thought therefore that the larger screen in a flexible mounting would not have failed. This result may have been due to the fact that the shot struck the screen on a convex surface and so altered the internal-stress distribution sufficiently to cause failure. To test this suggestion, a flat screen was made and this was tested (numbers 50 to 56, Table 2). The first four shots were made in a horizontal line at eye level and the screen withstood them (Fig. 5). The next three shots were made one higher and two lower on the screen and on each occasion it failed (Fig. 5). These failures may have been due to the fact that the two layers of material were not in contact on the rather crudely made screen which was tested.

All that can be said as a result of these tests is that it would seem that a suitable screen could be constructed, because the two attempts made were almost successful.

Goggles.—A series of different types of goggles was first tested in an effort to discover the most promising type even if they all failed. These types are given in Table 3 and the model numbers there shown are used throughout this Report. It will be seen from Table 4 that all these goggles showed some promise and it appeared that standard-type goggles might be modified to meet the impact test. We at once discarded those with metal fittings knowing they would not satisfy our molten metal tests even if they passed all the impact tests. Whilst they might therefore be suitable in those industries in which no molten metal is used, they would not be good enough for foundries. Other models were discarded because the side wings were opaque and this left Model 204 which was made from a clear cellulose acetate.

We then did a further series of tests on Model 204 (Table 5). We added an extra lens because our selected lens was so thin as to be loose in the goggle cup. The extra lens was just thick enough to take up the slack in the mounting. We found on testing that the front retaining-ring was cracked on the first shot which confirmed the earlier result (number 11 Table 4). Evidently the lens "dished" under the impact and transmitted the force of the blow in a forward direction (i.e., opposite to the direction of travel of the shot) cracking the retain-

TABLE 3.—*Types of Goggles Tested.*

Model Number	Description.
206	Moulded cellulose-acetate-frame goggles; adjustable ball-chain bridge; metal ventilators; 2 in. dia. lenses in moulded cellulose-acetate plastic screwed rims
204	Moulded clear cellulose-acetate plastic-frame goggles, designed to fit over ordinary corrective spectacles; adjustable-strap nose-bridge; 2 in dia. lens in moulded cellulose-acetate plastic screwed rims
672	Fabricated black-fibre-frame goggles, edged with P.V.C. material; adjustable-strap nose-pieces; 2 in. dia. lenses in metal base-rings with moulded cellulose-acetate plastic screw-top rims
540	Fabricated aluminium-frame goggles, edged with P.V.C. material; adjustable-strap nose-bridge; 2 in. dia. lenses in metal base-rings with moulded cellulose acetate plastic screw-top rims
541	Fabricated clear-plastic-frame goggles, edged with P.V.C. material; adjustable-strap nose-bridge; 2 in. dia. lenses in brass screwed rims, oxidised black finish
432	Fabricated 30-mesh wire-gauge-frame goggles, designed to fit over corrective spectacles; edges bound with leather strip; non-adjustable nose-bridge, 2 in. dia. lenses in metal screwed rims (aluminium).
106	Fabricated clear-plastic-frame goggles, designed to fit over corrective spectacles; edges bound with P.V.C. material; adjustable-strap bridges; 2 in. dia. lenses in metal screwed rims, oxidized finish

Goggle Sub-committee Report

ing-ring. The lens was undamaged and the retaining ring did not leave the threads which held it. Thereafter, a further seven shots in the same place on the same lens did no more damage. It appeared therefore that the resilience introduced by the cracked ring was sufficient to withstand the test.

At this stage in the work, a P.V.C. washer was introduced into the assembly because it was thought that this washer might provide sufficient resilience for the impact test. The washer could be placed on the goggle cup behind the lens or between the two layers of the double lens or in front of the lens immediately behind the retaining ring. We tried it in all these positions. (Table 6 gives the results.) It was evident that the best place for the washer was behind the lens but even with the washer in position, the retaining ring was liable to be cracked or prised forward on its threads or both under the impact of the shot.

It was decided therefore to try a nylon retaining-ring because we were informed that nylon would be stronger and we were certain that very little extra strength would be needed. The Model 204 goggle fitted with a P.V.C. washer behind the double lens and a nylon retaining-ring (see Fig. 6) was then tested with the results given in Table 7. It will be seen from this table that the pair tested needed eight consecutive shots on the same spot in the centre of one lens to do any material damage. Even then the shot did not penetrate as only the top lens cracked. On close examination of other specimens, it was found that a slight internal crack developed in the acetate cup after the first shot, but the goggles were virtually undamaged and we did not succeed in penetrating them at all or in breaking them in any way under eight shots. We therefore considered that this goggle was satisfactory in so far as impact properties were concerned.

TABLE 4.—*Impact Tests on a Variety of Goggles.*

Serial Number.	Eye-protection.	Position of shot.	Remarks.
6	206	One shot in centre lens	Lens undamaged; retaining ring cracked
7	206	One shot on frame near bridge	Lens undamaged; retaining ring cracked
8	672	One shot in centre of lens	Lens undamaged; retaining ring forced off its thread and the lens left the frame. Both ring and lens forced off in a forward direction (i.e. away from eye of wearer)
9	672	Lens and ring replaced after Test 8 and second shot in centre of lens	Lens undamaged; retaining ring forced off some threads, moving forwards as in Test 8. Ring held by last thread so unlike No. 8, neither ring nor lens left goggle frame
10	672	One shot on frame	Retaining ring slightly cracked and forced off its threads. Ring and lens left goggles in a forward direction (i.e. away from wearer's eye)
11	204	One shot in centre of lens	The lens was loose in the frame as it was not thick enough. No damage to lens; retaining ring cracked, but not displaced from goggle
12	204	One shot on frame (near bridge)	Retaining ring cracked and broken and forced off its threads. No damage to lens, but ring and lens forced off in a forward direction (i.e. away from wearer's eye)
13	540	One shot in centre of lens	Lens undamaged; retaining ring loosened, but neigher ring nor lens displaced from goggle
14	540	One shot on frame (near bridge)	Retaining ring battered; lens undamaged; both ring and lens remained in position
15	432	One shot in centre of lens	No damage
16	432	One shot on frame (near bridge)	Retaining ring battered; lens undamaged; both ring and lens remained in position
17	106	One shot in centre of lens	Lens undamaged; retaining ring loosened, but lens and ring remained in position
18	106	One shot on frame (near bridge)	Lens undamaged; retaining ring battered, but ring and lens remained in position
22	541	One shot in centre of lens	Lens undamaged, but driven back a little in goggles. The lens remained in the goggles and nothing would have damaged the eye of a wearer
23	541	One shot on frame (near bridge)	No damage
24	541	One shot in same place as in Test 23 and on same goggle	Lens undamaged; retaining ring and lens forced off in a forward direction (i.e. away from eye of wearer). After the test, the ring was screwed back and the goggles were still serviceable

Hot-metal Tests

We had introduced a nylon retaining-ring in the goggle which was finally developed, and in consequence, tested the nylon against heat before coming to a final decision.

Molten-metal

Using the molten-metal test described in the First Report with a projectile consisting of 145 grams of molten iron at a temperature of 1,400 deg. C. and with the specimen placed at 3 in. from the stop plate, we found that the nylon was satisfactory. The nylon was not wetted by the molten metal which did not adhere to the plastic specimen.

TABLE 5.—*Impact Test on Goggle 204*

Serial number.	Eye-protection.	Position of shot.	Remarks.
25	204	One shot in centre of lens	Result as for Test 11 (Table 4). Lens undamaged; retaining ring cracked but not displaced from goggle
26	Pair of goggles used for No. 25 were tested again with the cracked retaining-ring	,, ,,	Lens undamaged; no further damage to retaining ring which was not displaced from goggle
27	,, ,,	,, ,,	,, ,, ,, ,,
28	,, ,,	,, ,,	,, ,, ,, ,,
29	,, ,,	,, ,,	,, ,, ,, ,,
30	,, ,,	,, ,,	,, ,, ,, ,,
31	,, ,,	,, ,,	,, ,, ,, ,,
32	,, ,,	,, ,,	,, ,, ,, ,,

TABLE 6.—*Impact Tests on Goggle 204 with P.V.C. Washer.*

Serial number.	Eye-protection.	Position of shot.	Remarks.
35	204 with P.V.C. washer in front of lens	One shot in centre of lens	Lens undamaged; retaining ring forced off its threads
36	,, ,,	,, ,,	Lens undamaged; retaining ring forced off its threads and cracked
37	,, ,,	,, ,,	,, ,, ,, ,,
38	204 with P.V.C. washer behind lens	,, ,,	Lens undamaged; retaining ring prised forward very slightly at bottom. The ring was cracked, but did not leave the goggles
39	,, ,,	,, ,,	Lens undamaged. Retaining ring slightly cracked, but did not leave the goggle
40	,, ,,	One shot in same place as Test 39 on the same goggle	Lens undamaged. Retaining ring cracked and forced off its threads; ring left the goggle
41	,, ,,	One shot in centre of lens	Lens undamaged; retaining ring forced off its threads; the ring left the goggles
42	204 with P.V.C. washer between the lenses	One shot in centre of lens	Front 0.050 in. lens cracked; back lens undamaged; retaining ring cracked. Ball did not penetrate and all stayed in position
43	,, ,,	,, ,,	Lens undamaged; retaining ring cracked; all stayed in position
44	,, ,,	One shot in centre of lens	Front 0.050 in. lens broken; back lens undamaged; retaining ring cracked and forced off its threads. The ring left the goggle
45	,, ,,	,, ,,	,, ,, ,, ,,
46	204 with P.V.C. at back of lens	One shot in centre of lens	Lens undamaged; retaining ring cracked. All stayed in position
47	,, ,,	One shot in same place as Test 46 and on same goggle	Lens undamaged; retaining ring forced off its threads. The ring left the goggle
48	,, ,,	One shot in centre of lens	No damage
49	,, ,,	One shot on same place as for Test 48 and on same goggle	Lens undamaged. Retaining ring forced off its threads. The ring left the goggle

Some of the metal did adhere to the cold-steel holding-ring and this metal was in contact with the nylon for about one minute. There was no flame and the nylon did not burn, a little of this metal solidified on the nylon without burning through it.

Burning

The nylon was also submitted to the burning test described in the First Report using a circle of nylon 45 mm. dia. and 0.040-in. thick. The red-hot ball penetrated in 18 seconds, but there was no flame.

Miscellaneous Tests

Impact Test on Nylon

The 45-mm. nylon circles were tested in the material testing air-rifle rig described in the Second Report. Using two layers each 0.040-in. thick, the first centre shot did not damage either layer. The first layer was then taken out and retested by itself. This 0.040-in. thick circle of nylon, which had already been tested and therefore strained, now withstood one further shot without damage, but was penetrated by the second further shot (*i.e.*, the third shot in total). The other layer which had been tested as a double lens was also subsequently tested alone and was penetrated by the first further shot (*i.e.*, by the second shot in total).

Misting

When we thought that Model 204 could be successfully modified, it was immediately arranged that the goggles should be used in a foundry in order to discover the reaction of the wearers. These goggles were the standard Model 204 (Table 3) with the exception that double lenses were used. The front lens was made of coloured material for men handling molten metal. Anti-mist solution was provided for the convenience of the wearers but no impact tests were done on treated lenses. Ten cupola-keepers have worn this selected goggle since November, 1959, and they regard it as the best type of goggle they have tried and want to continue to use it. They say that there is slight misting sometimes between the lenses and also that when they perspire the rubber bridge-

Goggle Sub-committee Report

piece connecting the eye cups tends to slip allowing the whole goggle to move down the face. One other man used the goggles on casting, but he preferred a visor type of goggle although he could give no reason for his preference.

Conclusions

The committee's earlier conclusions remain unaltered and the last phase of the work has led to the following additional conclusions:—

(1) That a suitable rig to test any form of eye protection can be constructed relatively easily;

(2) that this test rig should be used in addition to the other tests described in our First and Second Reports;

(3) that these tests are so far in excess of any previously used in industry that in view of the greatly superior form of eye protection now available, they should be used as a minimum in foundries;

(4) that a moulded cellulose acetate frame goggle fitted with double "Celastoid" lenses backed by a P.V.C. washer and held in position by a nylon retaining-ring has withstood all our tests;

TABLE 7.—*Impact Tests on Goggle* 204 *with P.V.C. washer and Nylon Retaining-ring.*

Serial number.	Eye-protection.	Position of shot.	Remarks.
57	204 with nylon ring and P.V.C. washer behind lens	One shot in centre of lens	No damage
58	.. ..	One shot in same place as Test 57 and on same goggle	No damage
59	.. ..	.. ..	..
60	.. ..	.. ..	..
61	.. ..	.. ..	..
62	.. ..	.. ..	..
63	.. ..	.. ..	..
64	.. ..	.. ..	This eighth shot on the same spot broke the front 0.050 in. lens; back lens undamaged; nylon retaining-ring undamaged; some slight internal cracking in acetate cup; all stayed in position
65	.. ..	One shot in centre of lens	Lens undamaged; nylon retaining-ring undamaged. Very slight internal crack in acetate cup. All stayed in position. Goggle virtually undamaged
66	.. ..	One shot in same place as Test 65 and on same goggle	.. ..
67	.. ..	One shot on nylon ring near bridge	Retaining-ring broken. Lens undamaged. Nothing penetrated
68	.. ..	One shot on acetate bridge-pad	Acetate bridge-pad broken. No other damage to goggle. (This shot would have penetrated the face of the wearer below eye level)
69	.. ..	One shot on nylon retaining-ring	No damage
70	.. ..	One shot on lens ¼ in. from nylon retaining ring	No damage
71	.. ..	One shot on nylon ring	Retaining-ring broken; lens undamaged

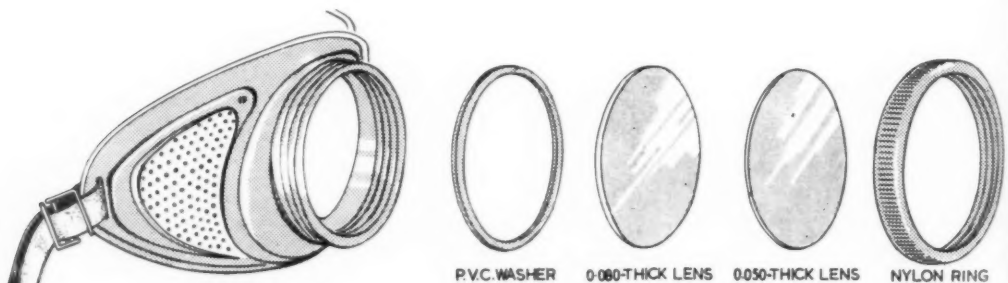


FIG. 6.—*"Exploded" view of the lens assembly of "model* 204*" goggle.*

(5) that this new form of goggle has been worn satisfactorily by 10 cupola keepers since November, 1959;

(6) that other forms of goggles appear to be almost good enough to satisfy the impact test. Some of these goggles might be suitable for use against molten metal and some were quite unsuitable, but further development work is needed to provide alternative forms of suitable goggles, and

(7) that every effort should be made to develop suitable visor-type goggles and suitable face-screens.

Acknowledgments

The sub-committee is indebted to Mr. Livermore of the Midland Motor Cylinder Company, Limited, for facilities for practical work; to the directors of B.S.A. Guns, Limited, for the prototype air rifles; to British Celanese, Limited, for lens specimens; to Mr. C. T. Knott of William Stephens, Limited, for his interest and assistance in the work; and to the directors of William Stephens, Limited, for many of the devices which have been tested. Without all this assistance, the sub-committee could not have done the work.

[The sub-committee report is signed by both members (Mr. A. W. Bushell and Mr. W. B. Lawrie).]

Polish Foundry Abstracts

A recent issue of the Polish foundry journal, *Przeglad Odlewnictwa*, reaching the FOUNDRY TRADE JOURNAL office contains two articles from which abstracts are reproduced as follow:

Separately-cast Test-pieces for evaluating the Strength Properties of Sand-cast Copper Alloys

By Z. Gorny and A. Fijal

The object of comparative studies was to determine the best pattern for pouring of separately-cast test-pieces from copper alloys made in sand moulds. The determination of such a pattern needed to reconcile a number of variables of a fundamental and empirical nature. Thus, the reliance on particular patterns or an assembly of patterns required application of the interpretation of the calculus of variation and of the calculus of probability. In addition, the effect of pouring temperatures on the mechanical properties of some standard copper alloys was investigated using the test-bar design which is put forward.

Production of Chilled Rolls from Spheroidal-graphite Cast Iron

By R. D. Rusiew

This article details the results of investigations carried out on the application of spheroidal-graphite cast iron for partly chilled rolls with a weight of 7 tons in the Lenin works in Bulgaria. The cast iron, with 0.4 to 0.6 per cent. Cr. and 1.2 to 1.8 per cent. Ni addition, is melted in an electric-arc furnace of 8-ton capacity. Magnesium in the amount of 0.54 per cent. is added under a bell-type seal. Partly chilled rolls of s.-g. iron it is stated will withstand the passing of 34,000 to 40,000 tons of rolled billets as compared with 20,000 to 25,000 tons which were obtained with grey cast-iron rolls. To increase the strength of the rolls, the carbon content may be reduced to 2.0 to 2.1 per cent. Instead of nickel content, the silicon content may be increased up to 2.0 to 2.2 per cent. and that of manganese up to 0.9 to 1.1 per cent., with a chrome content of 0.45 to 0.55 per cent.

(Other items included in this issue cover an account of the Ivor Foundry at Dowlais, S. Wales, short items on cooling of small cupolas, and a review of technical and scientific documentation pertaining to the foundry trade. In this last section, it is interesting to note that no fewer than 25 references are made to articles which have appeared in FOUNDRY TRADE JOURNAL.)

Fish in Cast Iron

By C. J. Robb

The story of the fish in cast iron appears to commence with members of the finny race depicted in armorial bearings on firebacks, plaques and other cast panels. The Dolphin was a heraldic bearing of the Dolphins of France, thus French castings with this device are still to be seen in some old houses in Paris, both on the fireback and mantelpiece pillasters. The "fish" is given in Charles's Roll as the shield charge of Gile de Fishbourne of Anglo-Norman descent. Back in 1773 Robert Fishbourne a clockmaker in Carlow, Ireland, had a fireback (Fig. 1) depicting two dolphins in the quartering of his shield still preserved. He also used this fish in the decoration of the dials of his clocks. The luce, or pike, was the heraldic fish of the Lucy family and an old gentleman farmer of this name in County Cork had a cast-iron pike on his entrance-gate pillars.

In the ornate Victorian water-fountains, dolphins in solo and entwined form were common to the world of casting and various other fishes appear on the sides and panels of horse drinking-troughs. Cast-iron and brass fish appear as the arrow of weather-vanes. In the ultra-naturalistic school of design in the last century, fish also appear in the bills of aquatic birds fashioned in cast iron. John Rowan, a Belfast ironfounder in the middle 1860s, made a small waterwheel for the Purdysburn estate. Each spoke of the wheel from the hub to the shrouding was a fish cast in iron over a wrought-iron core-rod.

FIG. 1.—*Robert Fishbourne's cast-iron fireback, circa 1740, showing fish in a heraldic device.*

Company News

Heating Engineers acquired by Parkinson Cowan

Parkinson Cowan, Limited, has purchased all the ordinary shares of Bastian & Allen, Limited, electrical and mechanical-heating equipment manufacturers, of Harrow (Middx). This acquisition, says Parkinson Cowan, is a natural extension of its interest in heating equipment for industrial buildings and processes which now embraces gas, oil and electrical appliances for domestic and industrial application. Bastian & Allen, founded in the early days of the electrical industry, makes electrode steam and hot-water boilers, mobile steam cleaning equipment, and cooling systems for diesel engines.

Sales of Bastian & Allen have been steadily expanding over recent years and the company enjoys a sound export business, says Parkinson Cowan. In the first six months of this year, production has been running at a high level and the company has substantial orders in hand.

The chairman of the company, Mr. F. D. Campbell Allen; the managing director, Mr. S. A. Williams; the sales director, Mr. J. C. Edwards; the technical director, Mr. E. R. Weech, and the Scottish sales director, Mr. J. Jamieson, are all remaining in executive control of the business.

W. H. Allen bid for William Foster

Cash offer worth nearly £1,500,000 has been made by W. H. Allen, Sons & Company, Limited, mechanical, hydraulic and electrical engineers, of Bedford, for the £79,905 preference and £343,845 ordinary capital of William Foster & Company, Limited, Lincoln, which, with its subsidiary, Gwynnes Pumps, Limited, designs and manufactures a wide range of pumping machinery and carries out contract work associated with this.

The offer is 20s. for each ordinary 5s. share and 20s. for each 6 per cent. cumulative preference £1 share. In last week's Stock Exchange trading the ordinary shares were quoted at 13s. 10½d. and the preference at 18s. 9d. ex dividend.

The directors of William Foster, who intend to accept the offer in respect of their own holdings, state that they consider the terms to be fair and reasonable, and unanimously recommend their shareholders to accept. It is intended that both businesses will continue as at present and the position of staff and employees will be unchanged.

Wellman Smith withdraws bid for Gibbons

Directors of Wellman Smith Owen Engineering Corporation, Limited, announced on August 26 that they were withdrawing their offer for the ordinary shares of Gibbons (Dudley), Limited, manufacturers of refractories and coal carbonizing plants, of Dudley (Worcs), in view of the offer by Wellington Tube Holdings, Limited, of 120s. per Gibbons £1 share.

The offer by Wellington Tube, reported last week, was recommended for acceptance by the Gibbons directors. They considered the terms of the Wellman Smith bid were inadequate.

FOUNDRY EQUIPMENT & L. & Y. HOLDINGS, LIMITED—Net profit for the year ended March 31, 1960, fell from £29,553 to £18,351, after tax of £15,786 (£29,035). The dividend is reduced by 10 per cent. to 5 per cent.

GEORGE KENT, LIMITED—Partnership has been entered into with the Italian firm of instrument makers, M. Tieghi & Company, for the company to acquire a majority holding of shares. Group net profit for the year ended April 2, 1960, was £307,061 (£226,388), and the dividend is maintained at 17 per cent. on capital increased by a three-for-eight rights issue.

KIRKSTALL FORGE ENGINEERING WORKS, LIMITED—The order book is full, reports Mr. R. F. Butler, the chairman. Difficulty in getting all the raw material wanted when the company needs it means that there are delays in deliveries to customers. Profit before tax for the year ended June 30, 1960, increased from £55,059 to £266,938 and the dividend is maintained at 12½ per cent.

WINGET, LIMITED—Final dividend of 10 per cent. on capital increased by a 75 per cent. scrip issue makes 13¾ (11¼) per cent. for the year ended March 31, 1960. Group net profit was £268,688 (£181,815), after tax of £131,923 (£98,866). Of the 648,000 ordinary 5s. shares offered at 6s. 3d. a share, 645,300 shares have been accepted representing over 99½ per cent. and the allotment of these shares has been confirmed.

STANDARD RANGE & FOUNDRY COMPANY, LIMITED—Interim dividend in respect of 1960 is raised from the equivalent of 3½ per cent. to 6¼ per cent. on a capital increased from £90,000 to £250,000. The equivalent total for 1959 was 18½ per cent. The company's shares were marketed last October. Mr. C. J. B. Pratt, the chairman, reports that turnover figures continue in excess of the previous year and that the order-book is well filled.

ELLIOTT-AUTOMATION, LIMITED—The offer for the issued share capital of the Rheostatic Company, Limited, has been accepted by the holders of more than 92 per cent. of the preference and of more than 93 per cent. of the ordinary stock. The increase in the company's authorized share capital has been approved and quotation has been granted for the new shares to be issued under the offer, which has therefore become unconditional.

AFRICAN METALS CORPORATION, LIMITED (AMCOR)—Sales in the year ended March 31, 1960, rose from £5,500,000 to £7,500,000, with exports increasing by £1,700,000 to £4,200,000. The net profit, after tax, rose from £422,000 to £929,000. A rights issue of 700,000 ordinary 10s. shares is planned, which would mean a ratio of four new shares for every 25 held. The dividend on the increased capital is 1s. 9d. The installation of additional electric furnace capacity to cope with the increasing demand for ferro-alloys is being considered. Production of ferro-alloys last year increased from 69,000 to 96,000 tons.

Head Wrightson to supply Cooling Towers for Mexico

Three "Counterflo" induced-draught cooling towers have been ordered from Head Wrightson Processes, Limited, a subsidiary of Head Wrightson & Company, Limited, by the turbine generator division of Associated Electrical Industries, Limited. The towers consist of three cells with two 20-ft. diameter fans and will each provide cooling water to one of the 3-33MW turbine generator sets which AEI is supplying to a new power station at Cuidad Juarez, in Mexico.

The cooling towers will reduce the temperature of the water, which circulates through the generator sets at the rate of 1,560,000 gall. per hour, from 89.4 deg. F. to 80 deg. F. Induced-draught towers were selected for the operation after it was found that the site available and the duty involved made them a more economical proposition than other forms of cooling.

South African Exposition . . . . *contributed by John Steele*

Review of the Foundry Industry's Participation in the £10,000,000 Union Show

Described as the greatest shop window Africa has ever known, the Union Exposition, held in Johannesburg earlier this year, attracted over three quarters of a million people. What follows is an on-the-spot survey of the part played by foundry firms and kindred organisations in this unique event. The stands themselves were on the whole excellently laid out, without overcrowding.

Coinciding with the celebration of fifty years of Union, the Milner Park showgrounds at Johannesburg, home of the Annual Rand Easter Show, were transformed for the Union Exposition at an estimated cost of £1,000,000 and, besides the agricultural section, housed 13 foreign pavilions and 450 Union exhibitors, with products ranging from novelties worth a few pence to the Chamber of Mines pavilion, where gold bars of value running into six figures sterling were on view. Altogether it is stated that there were goods on show to the value of £10,000,000. Throughout the showgrounds it was of interest to note the vital part played by castings at the various exhibits, ranging from locally produced knitting-machines to complicated machinery and agricultural equipment.

Participation by Founders

The show was of interest to foundrymen in that more foundries exhibited this year than in previous shows at the same location. A significant omission was that no foundry suppliers were included in the list, whereas in previous years there have been at least two, demonstrating coreshooting and moulding machines, the CO_2 Process, and, some years ago, the "Shaw" process. The majority of foundry exhibitors were housed in the Steel & Engineering pavilion, others in the Hall of South African industries and in the Empire Hall which housed domestic appliances. Smith & Wellstood (Pty), Limited, were in the last-mentioned hall, exhibiting a complete range of their coal-fired "Esse" and "Wellstood" cooking- and heating-stoves manufactured in their Springs Foundry and engineering works.

Awards

The Durban Falkirk Iron Company (Pty), Limited, of Durban, displayed electric cooking appliances and, side by side, old-fashioned and modern "Dover" coal stoves. This company was awarded a gold medal in the domestic appliances section. Aluminium and brass die-castings were much in evidence on their own and as component parts of locally made lawnmowers on the stand of National Diecasting Company (Pty), Limited, of Germiston. A gold medal was also awarded to this company in the light engineering section. Three gold medals were awarded in the heavy engineering division to the South African Iron & Steel Corporation, the Union Steel Corporation and East Rand Engineering Company, Limited (Germiston).

Pig-iron Production

The Iscor stand, combined with that of AMCOR, was centred around a halfscale model of the lower half of a blast-furnace. Inside this model there was a display depicting the historical background of Iscor and an animated flow-diagram in Perspex of a blast-furnace showing the method of operation. Photographs and art work referring to the industry, along with actual products were on view. The AMCOR part of the same exhibit showed samples of pig-iron, end products and ferro-alloys, with emphasis on the export of the latter. The Union Steel Corporation exhibited their range of alloy steels, hollow drill-steels, and a 2½-ton casting in steel for a crusher.

Other Cast Products

Other castings were shown on the stands of the East Rand Engineering Company, where there was a Meehanite 14-ft. dia. sheave-wheel in the right foreground and in the left background a 4 ft. 6 in. vertical boring mill designed and made in the works. The sheave-wheel and miller both were "working" models, a cast-iron patternplate forming the workpiece on the mill. A suction valve and pump for mining operations were also on the stand. In contrast with the heavy work on the E.R.E. stand, at the opposite corner of the pavilion was the stand of Silverton Engineering and Motor Works (Pty), Limited. This company has a die-casting foundry specializing in the production of aluminium castings for a variety of end-uses, including washing-machine agitators, aluminium pistons and telephone-booth coin-boxes.

J. Stone & Company Africa (Pty) Limited, though not themselves a foundry operating in the area, had a display of castings made in "Superston," which has only recently been introduced into South Africa, two large foundries having been appointed licensees, one of them being Standard Brass Iron and Steel Foundries, Limited. The latter firm was an exhibitor and the centrepiece of its stand was a cast-steel internal drive gear for use in the uranium plants. The casting was 7 ft. 10 in. dia. and weighed over 30 cwt. Included here also were three aluminium castings for an autoclave about 7-ft. dia., the largest weighing just under one ton. The Standard Brass foundry is one of the country's main producers of spun-cast bronze-bushes and sticks, some of which were also exhibited. Castings in the proprietary metal "Alzen"

South African Exposition

are made by the firm under licence and examples of these were also on show.

A "Meehanite" foundry, Escher Wyss Austral Iron Works, Limited, had on display cast-iron pumps as used by the mining and paper industries. One unit here was a locally manufactured deflaker used for the refibralization of paper pulp without cutting the fibre. In the centre here was a duplex pulp-pump and the largest casting was a multi-stage high-lift pump, utilising ferrous and non-ferrous components made in the company's foundry at Boksburg.

The Copper Development Association played an important part in the pavilion of the Federation of Rhodesia and Nyasaland, with an impressive array of copper products for the home and industry. Cast malleable fittings and brass sanitary ware were exhibited at various other stands throughout the show. In effect, no product of the foundry industry was neglected.

Art Castings

Next to the Chamber of Mines pavilion, with its fabulous wealth of gold, the most closely guarded place in the exhibition was the showcase at the main entrance, where trophies of the Witwatersrand Agricultural Society were on display. Castings also found a place here, and one local production in the showcase was an art casting made by the present author. This was the trophy presented by African Oxygen, Limited, for the best dual-purpose beast in the agricultural section of the show. The trophy was designed by Mr. W. Murton, a Johannesburg sculptor. From his own original drawing, Mr. Murton modelled each animal in clay, and the writer then made gelatine moulds of each for the subsequent reproduction of the pieces in plaster-of-Paris. The plaster pieces were returned to the sculptor for trimming and checking before being used as the patterns for moulding the various components.

Moulding

The moulds were made by piece moulding, using the CO_2 Process with a 200-mesh sand and 7 per cent. proprietary CO_2 binder. The largest figure—a cow—took seven hours of moulding time and itself consisted of ten pieces. The base and background fence and tree were made in two- and three-piece moulds respectively.

Casting and Finishing

The metal used for the trophy—melted by blow-lamp—was a lead/tin/antimony alloy, chosen for its ease of casting and subsequent silver plating. After removing the runners and risers, each casting was cleaned up, using sandpaper and polishing cloths. The entire trophy was assembled by the sculptor and the writer, using soldering and screwing techniques, and after being mounted on the wooden base was ready for presentation only six weeks after the job had been commissioned by the firm.

Progress at Durgapur

With stage I (including iron and steel foundry and engineering maintenance department) and stage II completed, semi-finished rolled-steel products are now being produced at the Durgapur Steelworks in India (which is being built by a consortium of British constructional engineering firms).

When the remaining stages III and IV are completed during the first half of 1961, finished rolled-steel products (*e.g.* joists, channels) will then come into production. By the end of June, 1960, approximately 95 per cent. of the plant and equipment being supplied from the United Kingdom had been shipped, amounting to approximately 243,000 tons, since the first shipment in February, 1957. Civil engineering work and the erection of structural steel is nearing completion and activity at the site is now largely devoted to the erection of mechanical and elecrical plant and equipment.

Training of Personnel

For the Durgapur Steelworks the UK Government is financing under the technical co-operation scheme of the Colombo Plan, the training in the UK of 350 engineers for supervisory staff. Up to June 30, 247 of these engineers have come to the UK; of these 168 have since returned to India, and there are at present 79 under training here in this country. The last group of engineers is expected about February, 1961.

Coke Ovens, Iron and Steel Making

Since the No. 1 coke-oven battery at Durgapur went into operation in November, 1959, approximately 178,000 tons of coke had been produced up to June 30 this year. The No. 2 battery has been completed and is ready to be commissioned and work has been commenced on the No. 3 battery which is scheduled for completion by April, 1961; the coal washery is also now in operation, along with most of the by-product plant.

No. 1 blast-furnace went into operation on December 29 last year, and up to June 30 approximately 153,000 tons of pig-iron have been produced. The No. 2 furnace is nearly completed and the shell of No. 3 unit furnace has been completed and work is now proceeding on the erection of the skip-hoist structure; this furnace is scheduled for completion by April, 1961, as part of stage III of the plan. In the steel melting shop, two out of the seven 200-ton open-hearth furnaces are now in production; up to June 30, the total quantity of ingots produced was approximately 10,200 tons. The third furnace has also been completed and is now ready for drying out; of the two 800-ton capacity hot-metal mixers, the first is completed and in operation and the second is now being bricked.

Rolling Plant

Of the rolling-mill plant, the 42-in. blooming mill the 32-in. intermediate mill and the continuous billet mill are in operation, and foundations for the 24 in. medium-section mill and the continuous merchant mill are completed and erection of the mill stands and ancillary equipment is now in progress. A wheel and axle plant is the last stage and this is scheduled for completion in July, 1961.

RESEARCH LABORATORIES, costing about £125,000, are to be built in Wandsworth, London, by Morgan Crucible Company, Limited, which makes a range of foundry and other products from carbon, clay, and graphite. The new laboratories will be ready to start fundamental research work in about a year's time.

Fencing of Dangerous Machinery . . . . . does it extend to Overhead Cableways ?

By "Barrister-at-Law"

The law's requirements with regard to the fencing of dangerous machinery are stringent, and the obligations on owners and occupiers of factory premises in this respect may be viewed from a variety of different angles, as is made clear from the case reported below. Its foundry connotations are obvious.

Attention might usefully be drawn to the recent decision in Quintas *v* National Smelting Company, Limited, 1960 (I) A.E.R. 104, in which an accident was caused by an overhead-travelling cableway. The injured employee in this case claimed damages, alleging that the employers had been guilty of negligence under Common Law and also of breaches of statutory duty under the Factories Act 1937. The Court held that there had been no negligence at Common Law and the main issues of importance accordingly centred round the question as to whether there had been breaches of statutory duty.

On this aspect of the case the employee contended that the employers had failed to fence securely a dangerous part of "machinery", the "machinery" being constituted it was alleged by the bracket of an overhead-travelling cableway which struck and injured the plaintiff as it was moving along. This it was said was a breach of the statutory duty imposed by S 14 (I) of the Factories Act 1937.

Background to the Accident

The material facts of the case were briefly as follow:—In the factory where the plaintiff was employed, an overhead-travelling cableway (or ropeway) was employed for the purpose of transporting material from one part of the factory to another. This ropeway was supported by stanchions, on each side of which ran a cable, and on the cable travelling in opposite directions, large buckets were constantly moving. The buckets were at intervals of 110 ft. and travelled at a maximum speed of 3 m.p.h. At that speed, the buckets would pass any given spot at the rate of twice a minute. There was no need for protection on those parts of the route where the buckets moved high from the ground. At one point, however,—at which the accident occurred—the cables crossed the flat roof of a building in which crushing plant was housed, at a height of only 4-ft. from the level of the roof of that building. Accordingly at this spot, there would be danger to persons who happened to be on this roof. On part of this roof, there was a small building, known as the magnet-house, to which access was obtained by a door opening on to a corner of the roof. A person coming out of this door on to the roof would turn left and walk a few paces to reach the door of the magnet house. This space where walking would have to be done was fenced in by handrail about 3-ft. high and consisting of two rails. In other words, the rest of the roof, including the route of the ropeway, was fenced off in this manner. There was, however, a gap of about 18 in. in this handrail which at some time previously had been cut away at this spot, in order to get some equipment through, and the rail had not been replaced.

The plaintiff, after finishing a job at the magnet-house, walked through this gap in the handrail to get to the edge of the roof in order to send a message to the foreman, when he was struck by one of the buckets and was injured.

The Court, although it held on the facts that the plaintiff's negligence was the main cause of the accident, nevertheless took the view that the employers were guilty of a breach of their statutory duties and were also to blame.

Three Questions of Law

To deal now with the three main questions of law that were raised in this case.

First, did the ropeway constitute "machinery" for the purpose of S 14 (I) of the Factories Act 1937, which requires the fencing securely of dangerous "machinery"? This appears to have been an entirely new point of law. Now it has been held that "machinery" for the purpose of S 14 (I) does not include machines or machinery manufactured in the factory itself. What is contemplated by the section is *machinery installed for use* in the factory in *connection with the process of manufacture or as ancillaries to such processes.* From this, it would appear to follow that, generally speaking, any machinery the *purpose of which is to transport materials* for use in the process of manufacture in the factory is to be regarded as an *ancillary* to such process. Thus, a conveyor belt would constitute such an "ancillary" and if that were so, it would seem to follow that overhead cables, with buckets for transport of materials for use in the process of manufacture in a factory, would likewise constitute "ancillaries," and accordingly are "machinery," for the purpose of S 14 (I) of the Act. Whereas the conveyor belts would operate over a limited area, in the particular workshop or workshops inside the factory, the overhead cables would operate outside and over a much wider range. The Court accordingly held that the overhead cables and buckets constituted "machinery."

The *second question* then dealt with was whether

Fencing of Dangerous Machinery

the cable and buckets constituted "dangerous machinery," for the obligation to fence under S.14 (I) extends only to "dangerous machinery." This raised the further question as to whether the cables and each bucket were to be regarded as *separate* pieces of machinery. The Court held that the whole of the ropeway, cable and buckets constituted one single piece of apparatus. This ruling, however, did not necessitate the inference that every part of the cable with buckets was dangerous. It was only such parts as were within striking distance of the persons standing near or underneath which became dangerous from time to time, as in the case in question where the moving cable and buckets came near the flat roof in question.

Definition of a "Fence"

The third question that arose was as to whether the employers had "securely fenced" such dangerous parts. A fence for this purpose is to be regarded as "secure" if it is designed to prevent contact, not only *accidental* contact, but also *deliberate* contact to a certain degree. Complete protection, on the other hand, is not essential. It need not be such that it can neither be climbed nor broken by an employee who is minded to do so. On the other hand, the fencing must be of such a character as to take into account human weaknesses, such as not only forgetfulness or inadvertance, but also the inclination to run minor risks and take short cuts —in other words, *some degree of recklessness* on the part of the employee. The Court held on the facts of the above case that the fence, even if complete, did not satisfy the above requirements and that accordingly it was not "secure" for the purpose of the section.

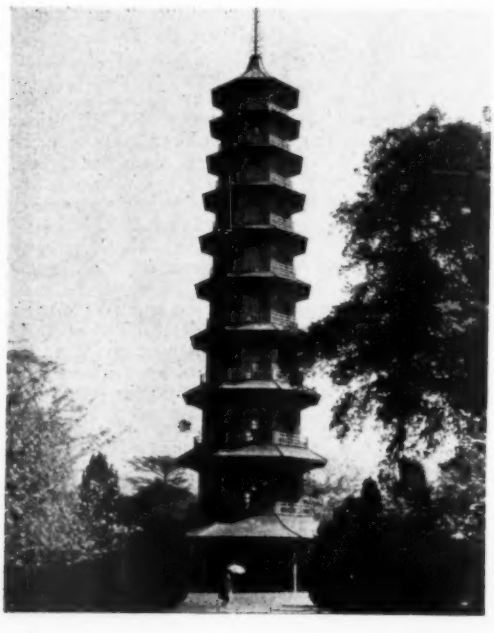
Conclusion

Although the employers were in breach, the employee himself was held to be in blame in the main, because of his own negligence, and the employers' responsibility was limited to one quarter.

Castings at Kew

A glaring example of a short run on a cast-iron floor-grille enlivened a recent visit by the writer to Kew Gardens, the Mecca of gardeners the world over. Whilst other visitors were exulting over specimens of exotic flowers and plants, an old cast-iron pump in one of the glasshouses was examined. The pump, still in use, carried the name plate, "Merryweather," London. In the gardens the art of the founder is much in evidence, either directly or indirectly: for instance, two examples of statuary castings seen in the grounds were: "A Sower," by Sir Hamo Thornycroft, dated 1886, and "Out in the Fields," by Arthur G. Atkinson, presented in 1929. In No. 1 Museum there is a bust of Charles R. Darwin presented in 1909. This was cast by the "lost-wax" process, and is mounted in such a manner that the interior can be fully examined. At the entrance to this museum there is an example of an old-fashioned cast-iron boot scraper with side brushes attached.

FIG. 1.—*General view taken in Kew Gardens, London, showing the Pagoda, which is referred to as originally decorated and roofed with cast-iron.*



The Pagoda (Fig. 1), erected in 1761-62 has cast-iron guttering and down pipes. Originally the building was decorated with 80 iron dragons (one at each of the eight corners of the ten roofs), and had iron plates on the roof. The glasshouses contain examples of foundrywork, including cast-iron ornamented support-columns, heating pipes and drainage plates. Though not actual castings, it is noteworthy that there is a metallurgical contribution to the gardens—the aluminium-alloy construction of "Australian House." This new type of glasshouse was designed to provide the minimum amount of shading for the cultivation of plants from the more arid areas of Australia. In the Dutch House (Kew Palace) which was rebuilt in 1631, there are several examples of ornamental foundrywork in the cast-iron fireplaces in the royal chambers. There are also pieces of bronze statuary. The end of the visit, brought the realization that the horticulturist and the foundryman have at least three things in common, they both work with "dirt," use "beds" and in the jobbing foundry at any rate, do a measure of "transplanting."

Barrington Hooper, C.B.E.

It is with profound regret that we announce the death of Mr. Barrington Hooper, C.B.E., chairman of Industrial Newspapers, Limited, the company which he created 34 years ago and to the extension and development of which he had consistently and unremittingly devoted his undoubted genius in the publicity field. Last Friday, after procuring a passage for Greece for a much-needed holiday, he had a fatal stroke. He was 75 years old and his early years were passed in Fleet Street, where he was on the staff of the late Lord Northcliffe and carried through a number of his projects, such as the London to Manchester air race. This early experience led him into a number of outstandingly successful achievements, notably the promotion of the War Bond Tank Campaign in 1916, and the subsequent Victory Loan and the Food Economy Campaigns. For these services he was awarded the C.B.E. in 1920.

After a brief spell of political activity, promoting the short-lived National Party, in 1924 he was appointed Controller of Publicity for the British Empire Exhibition at Wembley, the prospects of which at that time had fallen to a low ebb, and there were few recollections which gave him greater pleasure than the outstanding and world-wide success which was ultimately achieved for that event. His close connection with the foundry industry began in 1926 with the acquisition by Industrial Newspapers, Limited, of the FOUNDRY TRADE JOURNAL. He immediately took a profound and enthusiastic interest in the work of the Institute of British Foundrymen, which he retained to the end.

Not being technically trained, Mr. Hooper helped in the two sections which he could best serve—in financial matters and social activities. Actually, it was on his advice that in 1926, ladies were invited to the Institute's annual banquet for the first time, a procedure which has been continued ever since. By many foundry organizations his help was constantly sought in the selection of chief guests at their various functions. He was a war-time president of the IBF London branch (1939 to 1941). Insisting that full activities should be maintained as far as possible, under his direction a full programme was indeed carried through. From that time onwards, he was assiduous in his attendance at the IBF General Council meetings, where his special interest was finance. In the London branch he was a tower of strength and his personal efforts have contributed in a large measure to the outstanding success and huge membership of that organization. To the Foundry Trades Equipment and Supplies Association he gave invaluable help in the arrangements for last year's exhibition, and it is no exaggeration to say that its wonderful success was in no small measure due to his painstaking work on the organizing committee. Overseas foundrymen and their ladies particularly will long remember with pleasure the garden parties Mr. Hooper staged at his home in Harrow and which were a feature of both the 1939 and 1955 International Foundry Congresses.

It is not too well known that Mr. Hooper was equally active in British coal-mining technical circles and each year organized that industry's very large annual conventions. In the fishing industry, also, he was very prominent among employers' federations and, to the writer, it was always a matter for wonderment how he managed to live such an extremely active life. He was greatly in demand as an after-dinner speaker, where he had a justly deserved reputation as one of London's leading raconteurs.

Few people have made so many friends in such diverse fields of activities as Mr. Hooper and his passing leaves a multitude of voids.

Whilst the funeral was private, there is to be a memorial service at St. Bride's Church in Fleet Street at 12.30 p.m., on Tuesday, September 20.

Institute of Vitreous Enamellers

Twenty-sixth Annual Conference

The twenty-sixth annual conference of the Institute of Vitreous Enamellers is to be held at the Grand Hotel, Birmingham, from September 28 to October 1, 1960. Particulars of the programme are as follow:

Wednesday, September 28, 7.0 p.m. Reception and official opening of the Confair* in the Grosvenor Room and Gallery, Grand Hotel, Birmingham (delegates and ladies).

Thursday, September 29. The annual general meeting of the Institute will be held at 10.0 a.m. in the Barwick Room, followed by the presidential address. After luncheon in the Grosvenor Room, coaches leave for works visits to either Cannon Industries Limited, Bilston Foundries, Limited, or Valor, Limited. In the evening, from 7.30 p.m. to midnight, a "Michaelmas" dinner is to be held at the Regency Club, Shirley, near Birmingham, including dancing and cabaret, for delegates and their ladies.

Friday, September 30. This day is devoted to technical sessions, commencing at 9.15 a.m. Technical Session "A" is to be held in the Barwick Room when the following contributions will be included—"Abrasion Resistance"—a sub-committee report, and "Influence of Chemical Composition of Enamel and its Alkali Resistance," by A. N. Revell. Following luncheon in the Grosvenor Room, technical session "B" commences at 2.15 p.m., again in the Barwick Room, when the following papers will be presented—"Influence of Water-vapour upon the Adherence Reaction between Ground-coat and Sheet Iron," by Dr. L. Merker; "Evaluation of Aluminium Enamels," by A. W. Brace, and "Enamelling Aluminium," by A. H. Symonds. At 7.30 p.m., there is to be a banquet reception for delegates and ladies (also the Barwick Room) to be followed by the annual banquet in the Grosvenor Room (evening dress).

* A small trade fair, which is to be open throughout the Conference.

Saturday, October 1. Coaches leave at 10.30 a.m. for works visit to Ferro Enamels, Limited, Wombourn, with luncheon at the invitation of Ferro Enamels, Limited. Coaches leave Wombourn at 3.0 p.m. for return to the Grand Hotel.

Ladies' Programme

A special programme has been arranged for the ladies on Thursday, and coaches leave the Grand Hotel at 9.30 a.m. for visit to Royal Brierley Crystal Glass Works. Luncheon will be taken at the Lyttelton Arms Hotel, Hagley, followed by a visit to Hagley Hall and return to Grand Hotel at 5.30 p.m.

Further details and application forms can be obtained from the secretary, John D. Gardom, John Gardom & Company, Ripley, Nr. Derby, and these should be returned to head office not later than Wednesday, September 14. The secretary also states that owing to the limitation of numbers able to take part in each works visit, it is impossible to guarantee that delegates can be included in the party to visit the works of their first choice.

Latest Foundry Statistics

Malleable: Figures released by the Iron & Steel Board quote the production of malleable-iron castings during 1959 by the principal United Kingdom producers, as follows: Whiteheart 52,049 tons, blackheart 100,936 tons and pearlitic 14,463 tons; total 167,448 tons. An interesting sidelight is thrown on these figures by the information that of the whiteheart castings, 12,393 tons were annealed in electrically-heated furnaces without using ore and 39,295 tons were annealed by using ore. (The difference of 361 tons in these whiteheart totals, it is explained, is accounted for by castings sold before annealing and castings not annealed on the premises.) A total amount of 6,073 tons of new annealing ore were used during the year in the production of whiteheart castings.

Prominent South African Foundryman visits A.E.I.

Mr. S. Pienaar, general manager, African National Foundries, South Africa (and a past-president of the IBF South African branch) has been visiting a number of foundries in this country and intends later to participate in the 27th International Foundry Congress at Zurich (September 19 to 24). The illustration alongside shows Mr. Pienaar (right) at the works of Associated Electrical Industries (Manchester), Limited, on August 24. With him (left to right) are:—Mr. F. W. Nield (president, IBF Lancashire branch), Mr. D. Epstein (F. & M. Supplies, Limited), Mr. E. H. Beech (superintendent, foundries and patternshop, A.E.I. (Manchester), Limited, and a past-president of the IBF Lancashire branch), and Mr. C. R. Hardman (A.E.I. (Exports), Limited).

News from South Africa

Oxygen Enrichment

As a result of a visit paid by Mr. J. L. Harrison, technical adviser, steel processes, British Oxygen Gases, a further increase in usage of oxygen enrichment in steelmaking in South Africa is envisaged. He toured the works of the South African Iron & Steel Corporation at Pretoria and Vanderbijl Park where large quantities of oxygen are already used in steelmaking. Foundries and ferro-alloy manufacturers were also visited on the Witwatersrand and in Cape Town. As another result of the tour, tests are now being conducted on the use of the oxygen/L.P.G. non-consumable lances for the melting of low-density scrap in electric-arc furnaces.

Meehanite School

A "school" for "Meehanite" foundry executives was held recently in Johannesburg, the first course of this nature to be held in South Africa. Delegates attended from all over the Union and Central African Federation. Consideration of "The Cupola" was the first item on the curriculum and the design, construction, maintenance and operation of this type of melting unit were discussed. Later, the IBF film "Flow of Metal into Moulds" was part of the treatment of the subject when dealing with pouring, gating and risering. Under the title of "Sands and Refractories" a profitable revision time was spent considering such aspects as sand control, testing and mixing, in relation to local sand deposits.

"New Developments" gave the "pupils" an opportunity to learn something about a new abrasive-resisting Meehanite, known as "Almanite," shortly to be manufactured in the Union. Basic-lined and water-cooled cupolas were also the subject of debate at this session. After hearing lectures on the CO_2 Process and air-setting sands, the school wound up with a paper on the various aspects of selling which licensees should adopt to obtain best results from their campaign continually to develop the market for "Meehanite" castings. (The event was organized by the Meehanite Metal Research and Development Association of Southern Africa and Mr. A. G. L. Lewis, the Association chairman, presided.)

New Headquarters for Iscor

Plans are completed for the new £1 million headquarters administration and research buildings which will be built on a 30-acre site near Pretoria for the South African Iron & Steel Industrial Corporation, Limited. This project was first mooted in February, 1954, when it became apparent that new accommodation would have to be found on a new site for the research department. A dominant feature of the new buildings will be a ten-storey north-block which will rise to above the height of the "koppie" situated behind it. Further back from the road will be the six-floor south block, linked to the north block by the auditorium block, which will house an assembly room, boardroom and committee rooms; offices will be situated in the north block and also on three floors of the south block. The latter will, in addition, house restaurants and the library. Extensive use of Iscor steel is to be made in the buildings.

Construction will embody an all-steel welded-frame and steel curtain-walls and the panels of the façade of the buildings are to be finished in vitreous enamel. The spandrel panels of the curtain walls will be insulated with slag wool—a derivative of the Iscor by-product. Office partitions of steel construction will also be insulated with this material. Extensive gardens will be developed on the site: the buildings should be ready for occupation in 1961.

IBF Paper repeated at Vereeniging

Due to the disturbances in the Vereeniging area last March, when Mr. H. Steinhardt read a paper on non-ferrous practice at the South African branch meeting, no members or guests from Vereeniging were able to be present. Because of this, at the request of members who were unable to attend the reading in Johannesburg, the author gave his paper again at the USCO recreation club, Vereeniging, later in the session. Mr. N. Beveridge, works manager of USCO, Klipworks, took the chair, and there was a large audience, well representative of the metal industries in the area, including foundries, cable manufacturers and engineering concerns.

Iscor sends Steel to Sweden

Iscor steel slabs were exported for the first time when 1,000 long tons of slabs for re-rolling were recently shipped to Sweden. This shipment is in the nature of a trial, the slabs will be rolled into plate at the Swedish mills, the final product to be used for shipbuilding. When the new plate mill is commissioned at Vanderbijl Park works, steel plate for shipbuilding may be exported.

Industry Disruption

The disturbances last spring disrupted industry in the affected areas, notably the Cape, the monthly report of Barclay's Bank states. Particularly hard hit were the engineering and building industries and there were instances where work on large projects came to a standstill. For the greater part, however, manufacturers appear to have weathered the difficulties satisfactorily, keeping production on much the same level as earlier in the year. Even in areas where the demonstrations and riots were most severe, normal working conditions were rapidly restored.

Company Report—Vereeniging Brick & Tile Company, Limited

This company is expanding some departments of its refractories division in order to keep pace with the growing replacement requirements of the steel, foundry, copper, cement, glass and similar industries, while still maintaining enough surplus capacity to meet orders for capital works. The chairman reported that the beginning of the year had been at a reduced tempo in the iron and steel industry, but towards the middle of the year the whole industry was practically back on full production with orders on hand to maintain production at full capacity. This improved state of affairs had continued into the current year. Basic refractories are today being used to a greater extent than ever for steel production in South Africa. This development has meant a substantial increase in the demand for the company's product, with a corresponding falling off in the demand for silica brick. Compared with the position which existed only two decades ago, only a small proportion of the total demand for refractories in the Union is imported to-day.

Cars to be made in S. Africa?

South African Economic Affairs Minister, Dr. N. Diederichs, has stated in Johannesburg that South Africa should consider "breaking with the tradition" of assembling cars from imported parts, and that they should be made from "basic materials" in the Union. He was opening the South African factory of Willys Afrika which he described as the "first large-scale

News from South Africa

attempt on the part of the domestic industry to turn to manufacturing operations proper as distinct from the mere assembly of vehicles."

He said the Board of Trade and Industries had dealt with the question of manufacturing cars in the Union and the Government was considering certain recommendations. He would not at this stage anticipate what would be decided but thought it would be agreed that the time had come when positive steps should be considered, aimed at materially increasing the South African content of cars assembled in the country. He stated that it was significant to note that, although motor-assembly plants have been in operation in South Africa for 35 years, still only a minor proportion of the materials used are supplied by the Union. Two years ago 82 per cent. of the materials used by the industry was imported, involving a foreign exchange expenditure of £51,000,000. Dr. Diederichs said these figures reflected both the scope and the obvious need for increased local production.

Vokes plans to manufacture in Common Market

An "excellent and well-spread" order-book which should ensure full production for some months ahead is reported by Sir Ian Stewart-Richardson, chairman of Vokes, Limited, manufacturers of filtration and silencing equipment and specialized engineering products, of Guildford (Surrey). While the group manufactures and sells certain capital plant on its own account, he says, it also supplies initial equipment to a large range of manufacturers of capital goods, both for the home and export markets, and so far there would appear to be a continuing demand for these products.

Referring to the effects on the group's export business, should Britain continue to remain outside the Common Market, Sir Ian reveals that tentative steps are now under consideration for the group to manufacture certain of its products within that trade area. It is proposed to transfer the trading activities of the company to a new wholly-owned subsidiary to be called Vokes, Limited, leaving the company solely as a holding company which will be renamed Vokes Group, Limited.

A.P.V./Sivyer Agreement

A licensing arrangement has been reached between the Sivyer Steel Casting Company of Milwaukee, Wisconsin, USA and A.P.V.-Paramount, Limited of Crawley, Sussex, whereby the latter, a subsidiary of the A.P.V. Company, Limited, is to manufacture and sell Sivyer refinery fittings in Europe and in the British Commonwealth. The Sivyer Steel Casting Company ranks as one of the leading American high-quality steel foundries and is also recognized as having an outstanding reputation as a producer of refinery fittings. The latter, which are manufactured in carbon-, low-, medium- and high-alloy steels, include return bends, corner and terminal fittings, multiple hole headers, etc., such as extensively employed in process heaters and various refinery installations. Over recent years A.P.V.-Paramount, Limited, has established a similarly high reputation in the United Kingdom as a manufacturer of high-quality steel castings, particularly in stainless and heat-resisting steels employed by the petroleum and petro-chemical industries.

American Letter

State of the Foundry Trade in USA

Casting production in the US is expected to settle down to the slow pace of the steel industry, except for speciality items such as pipes and material-moving and conveying equipment which production is "tied up" with building, and highway-construction activities. US steel production, which seems to set the pace for the metal industry is moving along slowly at about 55 per cent. capacity. A bright spot recently indicated that new orders are exceeding operations by a 10 per cent. margin, thus promising a gradual improvement.

The automobile industry is unlikely to contribute much towards current recovery, as production of 1960 models has been completed and 1961 production is just beginning at a low starting-pace. Railroad equipment is threatening to settle down to a new "low" for the year (approximating the 1958 low).

The prospects for many of the steel and iron foundries are "tied" to the transport industry and with its recession, their activities correspondingly recede. With increased labour costs for the end of the year, the steel industry expects a stimulation in activities by customers anticipating a price increase, but the prospects for long-term improvement need a more substantial incentive. Meanwhile, the slow but steady gait of the present pace forecasts no further depth to the recession between now and the fall.

AIME Electric Furnace Convention

The 18th Electric Furnace Convention, sponsored by the American Institute of Mechanical Engineers, is to be held from November 30 to December 2 at the Morrison Hotel, Chicago. A total of nine technical sessions are to be held on November 30 and December 1 and will deal with such subjects as non-metallic inclusions in steel, factors in improving steel quality, control of non-metallics in steel for castings, developments in steelmaking processes, manufacture of carbide and phosphorus, new developments in castings, and manufacture of ferro-alloys. December 2 will be devoted to a choice of works visits to the South Works, US Steel Corporation, or Lemont Manufacturing Corporation.

Melting and Casting Symposium

The Institute of Metals division-sponsored sessions at the fall meeting are to be held from October 17 to 20. Among the technical sessions arranged, one will deal with diffusion in magnetic materials. Under the general heading "Melting and Casting," a whole-day symposium has been reserved on ingot-structure control, when six papers will be presented on this subject. Abstracts of all the papers to be presented will be published in the September issue of the American *Journal of Metals*.

NFA to discuss Labour Problems

The National Foundry Association is to hold its 62nd annual meeting at the Edgewater Beach Hotel in Chicago on September 22 and 23. Problems in relation to labour relations will occupy the two-day meeting and among the subjects to be dealt with are foreign competition, grievances and arbitration, management rights, contract negotiations, foremen training in labour relations, and short- and long-term business prospects.

CEMENTATION COMPANY, LIMITED—Lord Tweedsmuir has been appointed a director.

Equipment & Supplies

Oscillator

Hydraulic Machinery Drives, Limited, 101, London Road, Reading, Berks, have developed a hydraulic device (Fig. 1) for regularly oscillating any piece of equipment under a controlled stroke and frequency. The device consists of a double-acting cylinder with a stroke of from ¼- to 2-in. by increments of ¼ in. Reciprocation is achieved by means of a built-in pilot-operated directional

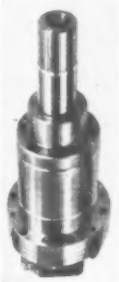


FIG. 1.—*Hydraulic oscillator unit developed by Hydraulic Machinery Drives, Limited.*

valve which supplies pressurized oil alternatively to each side of the piston. The speed of the stroke can be varied from 6 to 60 strokes per min. By building on a small flow-control valve, it is said to be possible to make the speed of reciprocation independent of load charges. The maximum force available in either direction is one ton. The maximum working pressure for the hydraulic oil is 1,000 lb. per sq. in. with maximum flow requirement of 1¼ gal. per min. for a 2-in. stroke at 60 strokes per min.

Weighing Equipment

A new range of electronic weighing equipment for use in handling bulk materials is announced by Elcontrol, Limited, Wilbury Way, Hitchin, Herts. The range includes the LC4 trip point controller and LC5 trip controller and margin indicator. In the LC5 unit, facilities are arranged for one or more remote deviation indicators which can show in percentage the approach to trip-point condition, this being adjustable by the manipulation of a ten-turn potentiometer control mounted in a convenient position on the front panel. The units are primarily controllers and the control is actuated directly *via* the amplifier. The equipment is intended to provide a control function when a pre-set weight is reached, and is designed for dealing with industrial loads to the order of from 20 lb. to 2,000 tons. Principal uses include the control of filling and emptying processes by weight from hoppers and tanks, and the automatic enforcement of safe load limits, in cranes and hoists.

Ferroclad Bricks

General Refractories, Limited, Sheffield, the sole licensees for the manufacture and sale in Great Britain of metal-cased basic bricks produced under the Heuer Patents (British Patents Nos. 546220, 778047, 778048, etc.) and which are sold by them under the trade name "Ferroclad," have decided that in view of the substantial increase in the demand for these bricks, especially in connection with the development of the all-basic furnace, it is in the national interest that these Patents should be made available to other manufacturers. Accordingly, arrangements have now been made whereby Pickford Holland & Company, Limited, will be entitled to manufacture metal-cased bricks under these processes and which they will market under their own name of "Metalclad."

Space Heating

Believed to be the largest gas-radiant heating system in the world, 480 gas overhead heaters have been installed in the eight bays of the Cammell Laird Company's new ship prefabricating shops at Birkenhead. The eight bays cover an area of more than 11 acres, and the roof heights vary from around 60 to 80 ft. The lengths of the open-ended bays vary from 750 ft. (five) to 500 ft. (two) and 350 ft. (one).

In view of the vast area to be heated, it was decided to use A.M.6 Parkinson Schwank gas-radiant heaters, mounted overhead. These heaters are mounted at a height of 23 ft. with an inclination of 60 deg., and the heating scheme was planned to provide an air temperature of 55 deg. F.

The ignition of the heaters is carried out electrically (utilizing hot-wire filaments) in groups of approximately one dozen. When all heaters are required to come on together, the groups are switched on at 10 second intervals; the time lag is incorporated in the control in order to prevent a surge in the gas main.

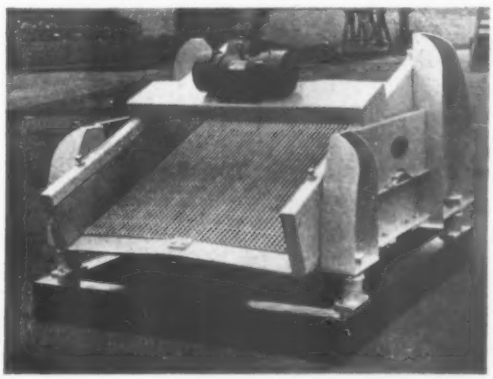
Vibratory Screens

Developments in high-speed vibratory screens design are announced by W. J. Jenkins & Company, Limited, Retford (Notts), which is now manufacturing its Viking screens with a completely new driving unit. The drive and vibrator are incorporated in the driving motor. The new screens are to be known as the Viking-Grantham (Fig. 2), and provide a distinct contrast with the type having the conventional out-of-balance shaft with heavy bearing and V-rope drive.

In addition to simplifying the design, there is considerable saving in horsepower required and a wide range of adjustments to the amplitude of vibration is easily obtained by a simple operation. These advantages, together with the adjustable angle of deck from 5 deg. to 30 deg., are claimed to make these screens ideal for a wide range of materials and duty.

Single- and double-deck models are at present available in two sizes—the Viking-Grantham Minor with a tray 4 ft. long by 2 ft. 7 in. wide and the Viking-Grantham Major with a 5 ft. long tray 3 ft. 7 in. wide.

FIG. 2.—*Viking-Grantham screen with drive and vibrator incorporated in the driving motor (W. J. Jenkins & Company, Limited).*



Personal

Mr. W. E. PEARSON has resigned from the board of Leyland Motors, Limited.

General Sir WILLIAM DUTHIE MORGAN has been appointed a director of Winget, Limited.

Mr. P. R. MCGEHEE has resigned from the board of the Aluminium Corporation, Limited.

Mr. W. B. WHITWORTH has been appointed sales manager of the alloys division of Union Carbide, Limited.

Mr. A. R. JACKSON has been appointed to the board of the Consolidated Pneumatic Tool Company, Limited, London.

Mr. GEORGE H. CLEAVER has been appointed manager of market research, Amco Division, of American Metal Climax, Inc.

Mr. F. BIRCHALL, chairman of Peglers, Limited, brassfounders, Doncaster, from 1938 to 1947, celebrated his 90th birthday last Saturday.

Mr. C. J. GRAYSON has been appointed group research director of the research and development centre at Leven, Fife, of Henry Balfour & Company, Limited.

Mr. V. J. BRYANT, formerly technical assistant to the managing director of the Lapointe Machine Tool Company, Limited, has been appointed technical director.

After 30 years with the British Aluminium Company, Limited, Mr. JAMES H. DICKIN, manager of the Latchford, Warrington, works for the past 18 years, has retired.

Mr. J. MITCHELL, chairman and managing director of Mitchell Shackleton & Company, Limited, Patricroft (Lancs), has been invited to join the board of Walter Somers, Limited.

Mr. A. W. THWAITES has been appointed commercial director of Richard Hill, Limited, a member of the Firth Cleveland group. Mr. H. M. MACGREGOR has been appointed works director.

Mr. ARTHUR W. GURNEY, a local director and chief cost accountant of Hadfields, Limited, has been appointed a director of its subsidiary, Hadfields Foundry & Engineering Company, Limited.

Mr. BRIAN PHILIP FROST, a 22-year-old estimator employed by Edgar Allen & Company, Limited, of Sheffield, has been awarded the George Russell Memorial Prize by the Institute of Cost & Works Accountants.

On October 4, Mr. CHARLES HENRY TRELEASE WILLIAMS, chairman of the Parkgate Iron and Steel Company, Limited, Rotherham, and a director of Tube Investments, Limited, will be installed as Sheffield's 337th Master Cutler.

Mr. R. TURNER has been appointed managing director of Powell Duffryn Technical Services, Limited, in place of Mr. D. G. HEMMANT, who has resigned from the company at the conclusion of his secondment to the British Mining Equipment Export Association.

Mr. J. D. MAITLAND has been appointed assistant secretary of English Electric Aviation, Limited, a subsidiary of British Aircraft Corporation, Limited. Mr. Maitland has been personal assistant to Lord Caldecote, managing director of English Electric Aviation, since 1958.

Mr. A. WHITTAKER, managing director of Keeton Sons & Company, Limited, Greenland Road, Sheffield 9, a member of the Firth Cleveland group, flew to America last Monday. The main purpose of his three-week visit will be to stimulate sales of the company's products in USA.

Mr. R. C. W. CAMERON has been appointed general technical superintendent of the Durgapur Iron and Steel Works, West Bengal. Mr. Cameron has been in the steel industry since 1927, and since 1956 has been general works manager of the Rhodesian Iron & Steel Company, Redcliff, Southern Rhodesia.

Mr. ISIDRO SANS DARNIS, Professor of Iron and Steel Metallurgy, sub-director of the *Instituto del Hierro y del Acero* (Spanish Iron and Steel Institute) and technical consultant to the Empressa Nacional Siderurgica, has been elected vice-president of the International Committee of Foundry Technical Associations.

Mr. A. R. JACKSON has been appointed to the board of the Consolidated Pneumatic Tool Company, Limited, 232, Dawes Road, London, S.W.6. Mr. Jackson is general manager of the company's Australian branch and will continue in charge of operations in that country. Joining the company in Australia in 1927, Mr. Jackson was appointed general manager of the Australian branch in 1952.

YALE & TOWNE INTERNATIONAL, INC., has completed arrangements to establish a branch office at Zug, Switzerland, near Zurich, operative from October 1. It is also announced that Mr. C. F. BURGMAN has been appointed managing director of Yale & Towne International, Inc., and Mr. J. O. SEWELL, managing director of the British divisions of the Yale & Towne Manufacturing Company, has been appointed a director and vice-president of Yale & Towne International, Inc.

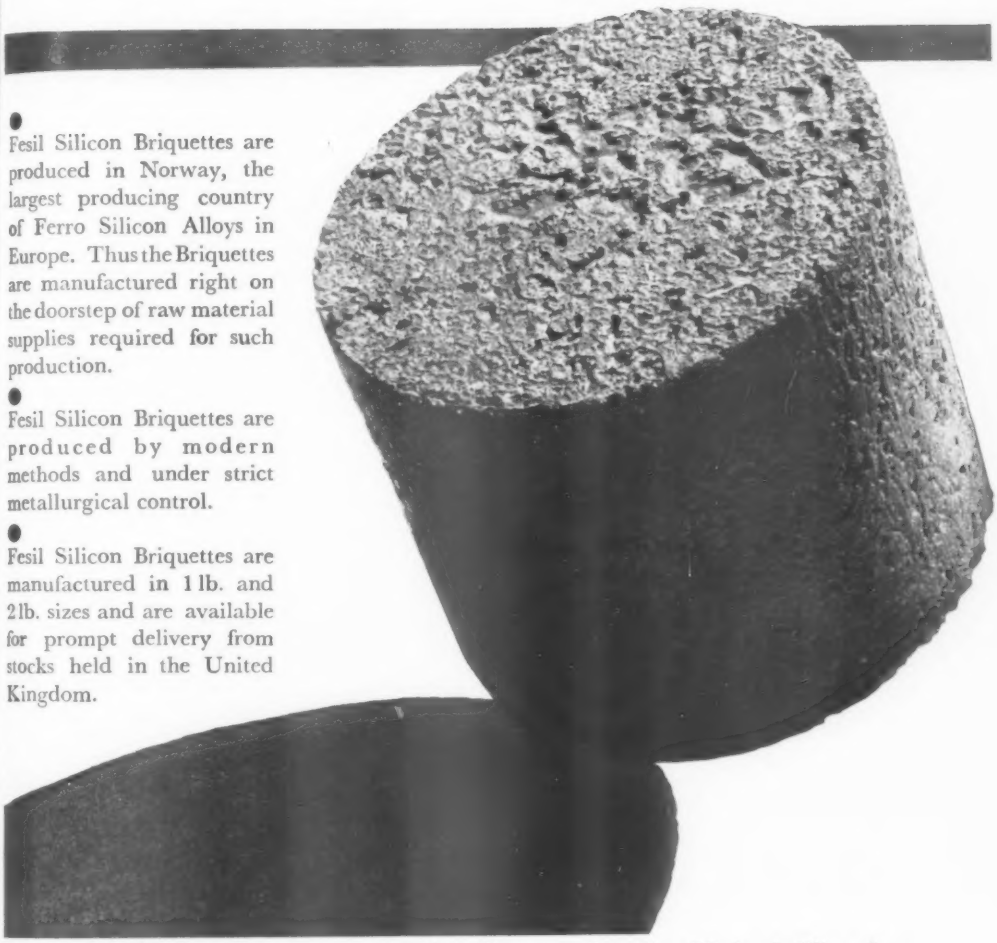
Sir ROY DOBSON, vice-chairman and managing director of the Hawker Siddeley group becomes chairman of W. G. Armstrong Whitworth Aircraft, Limited, Coventry, and Mr. W. S. D. LOCKWOOD becomes managing director. These changes follow the retirement of Mr. H. M. WOODHAMS, chairman and managing director. Mr. Woodhams remains a member of the board. Mr. Lockwood, who has been director and general manager of Armstrong Whitworth Aircraft for the last five years, is recognized as one of the leading authorities on production in the British aircraft industry.

Dr. R. H. GRIFFITH, director of research at the Gas Council's London research station, has retired. He joined the research laboratory of the Gas Light & Coke Company, Limited, in 1925 and during the ensuing 35 years built up a reputation in the field of catalysis. In 1945 he was appointed senior research chemist to the Gas Light & Coke Company, a position he continued to hold with the North Thames Gas Board after nationalization. Dr. Griffith was appointed controller of research of the board and director of the London research station of the Gas Council in 1952. He is a Fellow of the Chemical Society and of the Institute of Fuel, a member of the Faraday Society, and has been a member of council of the Institution of Gas Engineers by whom he was awarded the H. E. Jones medal on two occasions.

Mr. J. F. Stanners—a Correction

Use of the initial letters of the titles of organizations as abbreviations certainly saves pedantic repetition, but confusion can be caused by misinterpretation. This happened in reporting the promotion of Mr. J. F. Stanners on page 246 of the JOURNAL of August 25. Mr. Stanners has become head of corrosion research in the chemical department of the British Iron & Steel Research Association (BISRA) and not of the British Cast Iron Research Association (BCIRA) which was printed.

FESIL SILICON BRIQUETTES



- Fesil Silicon Briquettes are produced in Norway, the largest producing country of Ferro Silicon Alloys in Europe. Thus the Briquettes are manufactured right on the doorstep of raw material supplies required for such production.
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News in Brief

THE ITALIAN Biennial Machine Tool Exhibition will be held in Milan, Italy, from October 7-16.

PERMISSION has been granted by Kilmarnock Dean of Guild court for the erection of a new £95,000 factory extension for the Glacier Metal Company, Limited, at Kilmarnock.

NEW Scottish sales and service centre of Griffin & George, Limited, laboratory furnishers, etc., of Wembley (Middx), is to be opened at Braeview Place, Nerston, Glasgow, on September 22.

A CARGO OF 11,500 TONS of pig-iron is to be loaded in Durban this month for companies in Japan. It will be one of the many pig-iron cargoes to go to the Far East from South Africa this year.

THIS YEAR'S INTERNATIONAL RADIO HOBBIES EXHIBITION, organized by the Radio Society of Great Britain, will take place at the Royal Horticultural Society's Old Hall, Westminster, London, from November 23 to 26.

ALUMINIUM CASTING COMPANY, LIMITED, Greenock, was closed down last Saturday with the resultant redundancy of the 50 foundrymen employed by the company. The premises have been acquired by David Adams & Company, Limited.

CLAIMED to be the largest in the Commonwealth, a 7,000-ton magnet has just been completed by Joseph Sankey & Sons, Limited, Wolverhampton. The magnet was built in 20-ton sections, which the company produced at the rate of one a day.

GLASGOW FOUNDRY of David Rowan & Company, Limited, marine engineers, is to close at the end of October, to make way for an extension to the brass shop. The foundry employs 50 men, some of whom will be absorbed into other departments.

A.E.I. LAMP AND LIGHTING COMPANY, LIMITED, announce a reduction in the prices of their daylight, warm white, white 3,500 deg. K fluorescent lamps and a number of their colour-matching, natural and warm white de luxe fluorescent lamps. The reductions vary from 7 to 19 per cent.

APPROXIMATELY 70 per cent. of the 10,000 male employees of the South Durham Steel & Iron Company, Limited, will be contracted out of the State Pension Scheme. This will apply to all male members of the company's pension scheme whose average weekly earnings are at least £12.

NEW COMPANY—J. C. Bamford (Exports), SA—has been formed by J. C. Bamford (Excavators), Limited, Rochester (Staffs). The new company has its head office in Lausanne, Switzerland, and will control all export sales, carry spares, and provide service for JCB equipment on the Continent.

OF THE EMPLOYEES of W. P. Butterfield, Limited, manufacturers of transport and oil-storage tanks, of Shipley (Yorks), 26 have a total of 575 years' service. The record goes to Mr. J. Threapleton, who joined the company at the age of 18 as a plater and has carried on this work for 45 years.

PYRAMID INSTRUMENT CORPORATION of Lynbrook, New York, U.S.A., manufacturers of snap-on volt ammeters announce that their instruments will be available for purchase in England starting October this year. The London address of the Pyramid Corporation is 90, Fenchurch Street, London, E.C.3.

TENDERS are soon to be invited by the Commonwealth Railways for the supply of new rolling stock worth £A400,000, Mr. H. Opperman, the Australian Federal Transport Minister, has announced. The order will include 28 high-speed passenger bogies, 40 steel flat wagons, and 40 open goods wagons.

THE HUGE SURPLUS of British tankers—82 of more than 731,000 tons were laid up at the beginning of last month—is leading to a ruthless programme of scrapping by the oil companies. One of the tankers, the Limatula, which is not yet ten years old, is to be broken up by Thos. W. Ward, Limited, at Inverkeithing.

OVERALL LEVELS of import and export prices in July were virtually unchanged from those in June, the import price index continuing at 98 (1954 equals 100) and that for exports at 111. The export price indices rose for each of the groups of manufactured goods, with the exception of engineering products.

IMPERIAL CHEMICAL INDUSTRIES, LIMITED, metals division, announce further major reductions in the basic prices of their wrought titanium. The reductions affecting deliveries after November 1 next, range from 15 per cent. for rod, extrusions and commercially pure sheet to 10 per cent. for plate, wire and alloy sheet.

BURROUGHS ADDING MACHINES LIMITED, who employ 2,300 at their factories in Vale of Leven and Cumbernauld, are launching an expansion programme which will provide employment for 1,200 at their Scottish factories by next August. More than 60 per cent. of Burroughs production in Scotland is exported to 84 countries.

PENSIONS at twice the present rate are to be given to all male manual employees of Castrol, Limited, in the UK who are members, or who later become members, of one of the group's pension schemes. The company has also decided that all its employees in the UK shall participate in the Government's new graduated pension scheme.

A £1,500,000 CONTRACT has been received by Head, Wrightson Iron & Steel Works Engineering, Limited, from the Appleby-Frodingham Steel Company for the design and construction of further extensions to their ore-preparation and sinter plants. This brings the value of orders received by the Head, Wrightson group within the past two weeks to £2,565,000.

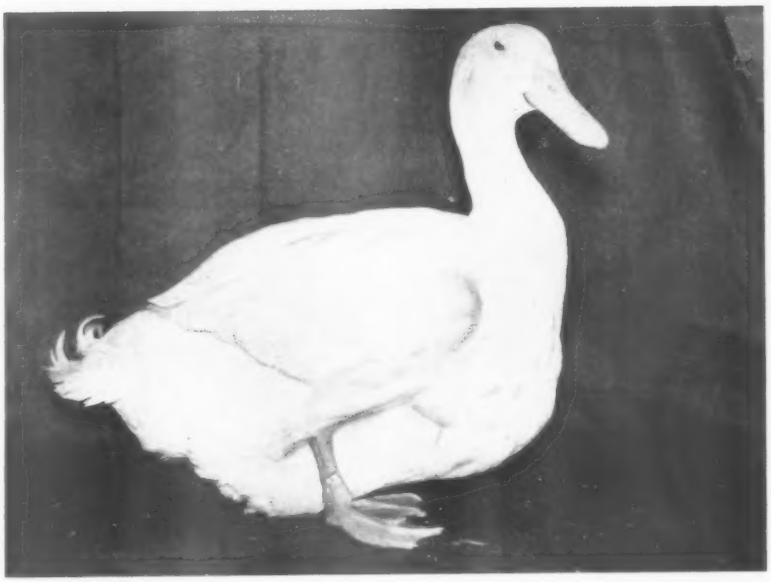
THE MANILA (PHILIPPINES) COMPANY Prime Industries Inc., of 275 Juan Luna, is reported to have proposed a joint venture or licensing agreement with a US firm for the manufacture of automobile parts. The firm is presently engaged in the production of automobile parts and wishes to expand and diversify its activities to include related American products.

PUBLIC INQUIRY has been ordered by the Minister of Power into proposals by the Central Electricity Generating Board to build a power station—which would be the largest in Europe—in the Nottinghamshire green belt at Holme Pierrepont. The inquiry will take place at Radcliffe-on-Trent on November 22. Since the proposals were first made known there have been vigorous protests against them.

EXPORT CONTROLS on about 70 items are to be abolished by the Indian Government, Mr. Lal Bahadur Shastri, the Minister of Commerce, has announced. The items include a number of chemicals, including calcium carbide; engineering goods such as electrical instruments; certain copper manufactures including wires, sheets, strips, and plates; lead alloys, rubber belting, and vessels for harbour and inland navigation.

UNDER A SUGGESTIONS SCHEME run by the Morgan Crucible Company, Limited, Battersea, Mr. James H. Fairweather (57), laboratory assistant in the company's research department, has been awarded £225. His alteration to the cooling system of a laboratory furnace will save approximately 10,000,000 gall. of water per

AYLESBURY FOR DUCKS



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News in Brief

year, and represents an annual saving to the company of £400. The company already this year has paid out £790 to employees under the scheme.

ENGINEERS AND STUDENTS from many different countries visit the Ettingshall works of John Thompson, Limited. Currently at the works for a period of study of education and training in industry is Professor H. A. Tarifa from the university of La Paz, Bolivia, who has come to England under the Federation of British Industries' scheme for overseas scholars. Another student at present studying at John Thompsons is Mr. M. A. Youssef, a graduate of Alexandria University, who is interested in boiler maintenance and power-house operation.

WESTERN AUSTRALIA'S PREMIER, Mr. Brand, hopes to persuade the Federal Government to lift its ban on the export of iron ore from his State. He has flown to Canberra to seek a licence to export the ore. Last October the Federal Government refused to permit iron-ore exports from Western Australia on the grounds that Australia's present limited resources must be conserved. Prime Minister Menzies stated that iron and steel were of basic importance to Australia's economy. Mr. Brand said recently that there were big iron-ore deposits in Western Australia that had no immediate or economic value. He believed this ore could be exported to the advantage of his State and Australia as a whole. Australian iron-ore production last year rose by 250,000 tons to over 4,000,000 tons.

THE FOUNDATION STONE of a building to house equipment for one of the world's largest single telecommunications projects was unveiled in Sydney recently by the chairman of the Overseas Telecommunications Commission, Mr. Kellock. The new building will be the starting point of a cable linking Sydney with Vancouver by way of Auckland, Suva, Fanning Island and Hawaii. The circuit will then cross Canada to Montreal and extend across the Atlantic to London and Europe. Initially the cable will provide 75 telephone circuits and 90 telegraph circuits. Later, 9,000 miles of cable will lie under the ocean about 3 miles deep. Every 30 miles there will be a repeater amplifier. The cable should reach New Zealand in 1962 and the entire project be completed in 1964.

AUSTRALIAN EMBASSY OFFICIALS in Tokyo are trying to interest the Japanese aluminium industry in the purchase of bauxite from northern New South Wales. Mining experts have estimated that there are about 15,000,000 tons of bauxite deposits around Inverell, Tingha, and Emmaville. Other reserves in the area have not yet been surveyed. Since his return from a recent visit to Japan, the N.S.W. Mines Minister, Mr. Simpson, has sent information on the deposits and the likely cost of bauxite to the Australian commercial counsellor in Tokyo, Mr. Neville Stewart. It is understood the deposits in northern N.S.W. could be mined economically by the opencut method, but the cost of freighting could be too high for Japanese interest. Trial shipments of Australian bauxite have already started to go to Japan from the Darling Range area in the south-west of Western Australia.

THE GAS ATMOSPHERES DIVISION of Incandescent Heat Company, Limited, Smethwick, has just received a contract worth approximately £55,000 for equipment to be installed in a large Belgian steelworks. The order, which was obtained within the Common Market against unusually strong Continental and American competition, is for three gas-generators each producing 10,000 standard cu. ft. per hr. of a nitrogen/hydrogen mixture. Such mixed gases are now becoming increasingly important for such processes as controlled-atmosphere annealing; for sintering, and the reduction of certain metal oxides. Another advantage claimed is that with this method, no highly-explosive rich-hydrogen gas can ever be present in a furnace. The plants will operate on coke-oven gas, but the design is said to be equally suitable for town gas, propane or butane. The firm has already supplied 67 nitrogen generators and the present contract will bring the number of those operating overseas to 19 (*i.e.* nearly 30 per cent. of the total).

AN AFTERNOON CONFERENCE on "Management Ratios and Interfirm Comparison," organized by the Harrow and Wembley Productivity Association in conjunction with the Centre for Interfirm Comparison, is to be held in the Council Chamber of the Federation of British Industries at 21, Tothill Street, London, S.W.1, at 2.30 p.m., on November 3. The idea behind the conference is that the success of a business depends upon the ability of the management to ensure that there are sound relationships between resources used and results achieved (*e.g.* between capital employed and profit; man/hours worked and output; selling area and turnover) and between assets and liabilities and their various components (*e.g.* liquid assets and current liabilities, fixed assets and total assets). An attempt will be made to expand these views in terms of management ratios and comparisons between firms. Tickets for the conference cost two guineas each and are obtainable from the honorary secretary, Harrow and Wembley Productivity Association, c/o Kodak, Limited, Harrow, Middlesex.

Obituary

Co-founder of the Lanchester Motor Company, Limited, Mr. FRANK LANCHESTER has died at the age of 90. He founded the company with his brother in 1899 and was sales director and later managing director. He relinquished his managerial responsibilities when Lanchester Motor was acquired by BSA in 1931 and became a director on the new board.

Mr. T. H. WEAVER, who retired recently from being foundry production manager of W. & T. Avery, Limited (Tame Bridge Foundry), died on September 4 after a long illness. He was past-president (1956-7) of the Birmingham branch of the Institute of British Foundrymen and was closely associated with the Coventry section. Mr. Weaver commenced his foundry and engineering career as an apprentice at the works of Wolseley Motor Company, Limited, studying also at the Birmingham Technical College. After a period with the B.S.A. Company, Limited, he was 16 years with Alfred Wiseman & Company, Limited, before in 1931 becoming foundry production development engineer at W. & T. Avery, Limited. During the second world war he was in charge of the firm's light-alloy foundry and shortly afterwards was responsible for the operational layout of their new mechanized foundry at Sherburn-in-Elmet; later he had much to do with the layout and equipping of the Tame Bridge Works. Mr. Weaver will be remembered by many British founders for his ever-readiness to contribute on a technical plane, particularly in assistance to the younger generation. (Mr. Weaver's funeral on Wednesday at Solihull Cemetery, Birmingham, was attended by many representatives from the foundry industry and the Institute.).

LSR 81 Grinder at work on a heavy casting

COMPRESSED AIR for the FOUNDRY

Atlas Copco puts compressed air to work for industries of every class—light, medium and heavy. For foundry work there are Atlas Copco rammers, chipping hammers and grinders carefully balanced to reduce operator fatigue and ensure the best possible results. For example, rammers are designed to "walk" with a minimum of guidance, allowing the operators to give all their attention to tamping.

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Atlas Copco heavy duty grinders are easier, less tiring to use. They combine maximum power with minimum size and weight and are designed for the quietest possible operation. Special safety governors ensure constant speeds regardless of varying loads. These grinders open the way to increased output; with Atlas Copco R-type chipping hammers they form a range of robust, reliable tools for all types of fettling and dressing operations.

Air hoists — accurate to a fraction !

For ultra-sensitive control, Atlas Copco air hoists are in a class of their own. Their infinitely variable speeds permit loads to be placed with ease and accuracy. The air motors are fully protected and the hoist can be operated with complete safety in any atmosphere — hot, dusty, damp, explosive or corrosive.

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With companies or agents in ninety countries, Atlas Copco is the largest organisation in the world specialising solely in compressed air equipment. Products include stationary compressors from (2.5 to 20,000 c.f.m.) ·08 to 566m³/m portable compressors, air tools, rock drills, loaders and paint-spraying equipment. Wherever you are, the international Atlas Copco group offers expert advice and provides a complete after-sales service.

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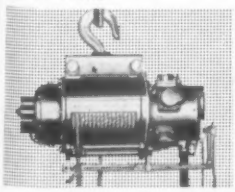
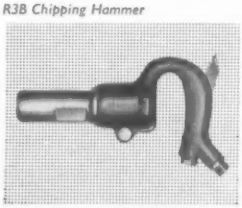
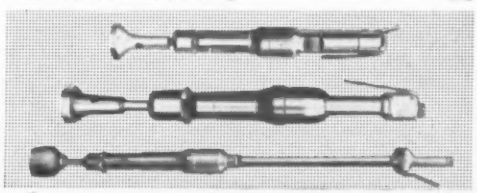


R3B Chipping Hammer



3 Rammers from the Atlas Copco range STR2



Raw Material Markets

Iron and Steel

Current outputs of pig-iron in all grades are sufficient to satisfy demands of consumers for both consumption and additions to stock where required. Production of basic pig-iron, which comprises a large part of overall outputs, is at substantial levels, and the steelworks are able to obtain all the supplies they require for their high rate of ingot production, although difficulty is still experienced in maintaining fully their requirements of scrap.

In the foundry grades of pig-iron, adequate tonnages are available, and no difficulty is found in fulfilling present demands; in fact, most producers would welcome an increase in current orders, as apart from the stocks they hold they have tonnages to spare from their daily outputs. The low-phosphorus irons continue chiefly in demand, and there is also a good call for hematite. Medium-phosphorus and high-phosphorus irons are plentiful and tonnages are available for the export market when orders can be secured.

The engineering and speciality foundries continue to be the most favourably employed in the production of high-quality castings, and with the orders at present on hand are able to maintain a high level of output. The motor vehicle trade utilizes large tonnages of castings, but the pressure for supplies shows a slight decline, some of the foundries catering for this trade have reduced their intake of pig-iron. The foundries supplying castings to the machine-tool trade are busy, and good demands are also being made by other large consumers of high-duty castings.

The building trades maintain their higher demand for castings, which keeps the light foundries supplying them reasonably well employed. The domestic utensil trades' requirements remain moderate. Most of the jobbing and textile foundries are fairly well employed, but with capacity to spare.

Apart from special qualities, the foundries are able to obtain the required supplies of scrap. Foundry coke deliveries are satisfactory.

Non-ferrous Metals

Copper is in an unhappy position on both sides of the Atlantic. In general terms, production is running well ahead of consumption and, in this country, stocks at the end of last week rose by 1,288 tons to 8,399 tons, while in the US stocks at the end of July, in the hands of fabricators, totalled 459,871 tons. Consumers, aware of the supply position, have been reluctant to enter the market and the price in London has dropped accordingly. Indeed, the quotations have breached the notional barrier of £240 a ton without meeting any real resistance.

Moreover, there has been an unexpectedly early settlement of the wages dispute in Northern Rhodesia and there are many observers of the metal scene who feel that the negotiations between Anaconda and Chuquicamata will come to a successful conclusion before the end of this month when the mineworkers' labour contract expires.

The unsettled situation in the Congo has been largely responsible for the big build-up in stocks and unless the position there worsens markedly consumers will be inclined to live off their fat. Meanwhile, it would seem that the US price structure will have to weaken and a reduction in the custom smelters' price is looked for in the not too distant future. At present the US price for both custom smelters and producers is 33 cents a pound although it is known that deals are taking place below this figure. The outlook for any reversal of the present downward trend hinges on developments in the Congo.

Tin after experiencing a spell of weakness in London and in the East appears to have settled down. The underlying cause of the recent weakness in this market was that the International Tin Council has announced that there will be no quota fixed for the quarter commencing October 1, 1960. This means that the mines will be able to produce as much as they can and, in addition, dispose on the market any of their respective stockpiles. The market took this badly at first but second thoughts are that the Council's decision is based on the assumption that production cannot be expanded greatly above its present level; that stocks are not of an unwieldy size; and, finally, that the present level of consumption will be maintained or even extended. Time alone will give the answer to the wisdom or otherwise of the Council's decision. Meanwhile, the price in London is fluctuating narrowly around £800 a ton and that in America around $1.03 cents a pound.

Lead is still a weak market on both sides of the Atlantic and the outlook is for a continuation of the present trend with the LME price trying hard to maintain a level above £70 a ton. In the US the price is unchanged at 12 cents a pound.

Zinc has shown a slight improvement after its recent weakness although not enough to send the price much above £85 a ton. The announcement by the Board of Trade that it will be selling about 1,600 tons of zinc by tender between October this year and March, 1961, has not been considered as of much significance. This is probably due to the fact that the Board of Trade's metal is mainly high grade and special high grade and, therefore, unlikely to find its way to the LME where quotations are in respect of "good ordinary brand" metal. In the US the market is flat with the price unchanged at 13 cents a pound.

Forthcoming Events

Institute of British Foundrymen

SEPTEMBER 13

Slough section:—"Low-pressure Die-casting," by Mr. E. C. Lewis, 7.30 p.m., at the Lecture Theatre, High Duty Alloys, Limited, Buckingham Avenue, Slough.

Institution of Plant Engineers

SEPTEMBER 14

Western branch:—"Motorway," film and talk on the construction of the M.1., 7 p.m., at the Royal Clarence Hotel, Exeter.

SEPTEMBER 15

Blackburn branch:—"New Developments in Fuel and Power Technology," by Professor M. W. Thring, 7.30 p.m., at the Castle Hotel. (Joint meeting with the N.W. section of the Institute of Fuel.)

SEPTEMBER 16

Birmingham branch:—Meeting of the mobile plant discussion group, 7.30 p.m., at the Imperial Hotel, Temple Street.

Institute of British Foundrymen

SEPTEMBER 17

West Riding of Yorkshire branch:—Tea by invitation of the president, 5.30 p.m., at the Bradford Institute of Technology, followed by the presidential address in the Main Hall at 6.30 p.m., and presentation of prizes to winners of the S. W. Wise Apprentice Competition. Two films—"Hazard" and "Bubble Model of a Metal Crystal" will also be shown.

[The Editor would be pleased to receive from the secretaries of the various technical associations details of their programmes for the 1960/61 session for inclusion in this column.]

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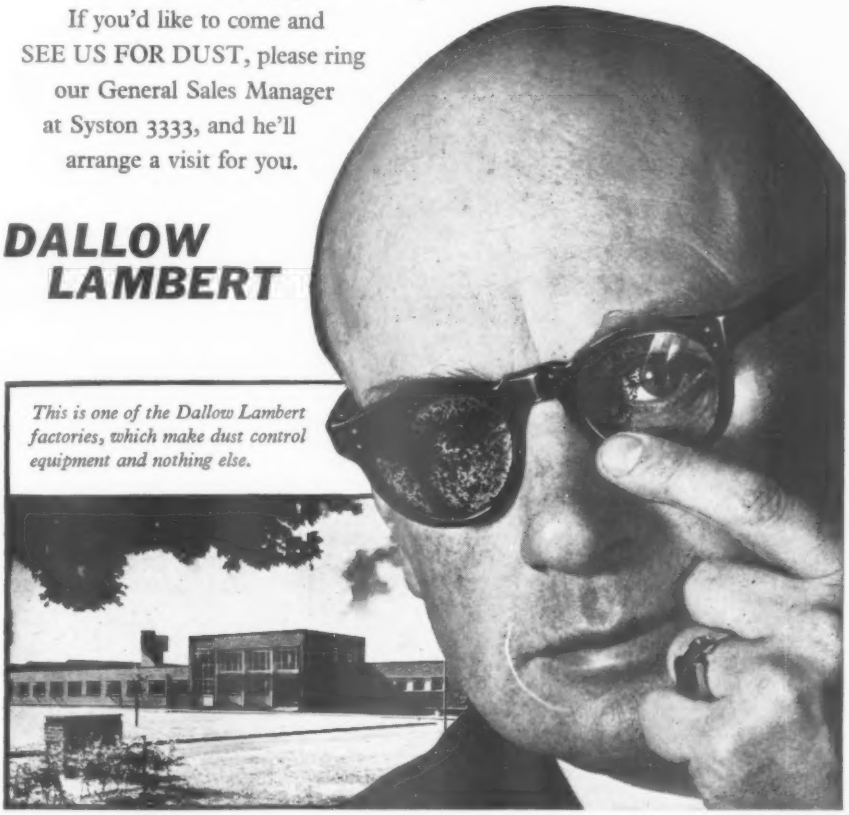

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BELLE VUE SEPT. 21st - OCT. 1st

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

September 7, 1960

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2, 10-ton lots or over: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.40 per cent. P, 10-ton lots or over, £23 5s. 0d., delivered Birmingham, £23 10s. 0d., delivered Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 6s. 6d.; South Zone, £25 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.; North Zone, £26 6d. 6d.; South Zone, £26 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent., 10-ton lots or over; N.-E. of England (local iron), £23 19s. 0d.; Scotland (Scotch iron), Zone S.1, £24 5s. 6d.; Sheffield, £25 7s. 6d.; Birmingham, £25 14s. 0d.; Wales (Welsh iron), £23 19s. 0d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leicestershire in 10-ton lots or over.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-Silicon (6-ton lots and over).—45 per cent. Si, £42 10s. 0d. to £44 10s. 0d., scale 15s. 0d. per unit, lumpy; 75 per cent. Si, £57 15s. 0d. to £61 10s. 0d., scale 15s. 0d. per unit, lumpy.

Ferro-Vanadium.—50/60 per cent., 20s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 10d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 12s. 1d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 15s. 1d. per lb. of W.

Ferro-chrome (6-ton lots and over, lumpy).—4/6 per cent. C, £80 10s. 0d. to £84 10s. 0d., basis 60 per cent. Cr. scale 27s. 0d. to 28s. 6d. per unit; over 6 per cent. C, £79 0s. 0d. to £82 10s. 0d., basis 60 per cent. Cr, scale, 27s. 0d. to 28s. 6d. per unit; 2 per cent. C,* 1s. 8d. to 1s. 11d. per lb. Cr; 1 per cent. C,* 1s. 8½d. to 1s. 11½d. per lb. Cr; 0.15 per cent. C,* 1s. 9½d. to 2s. 0½d. per lb. Cr; 0.10 per cent. C,* 1s. 9¾d. to 2s. 0¾d. per lb. Cr; 0.06 per cent. C,* 1s. 10¾d. to 2s. 1d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £275 0s. 0d.; 96/98 per cent., £285 0s. 0d.

Ferro-columbium.—65/67 per cent., Cb + Ta, 19s. 9d. per lb., Cb + Ta.

Ferro-manganese (Standard).—78 per cent., £61 10s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t.s. 100 tons & over, £31 15s. 6d.; tested, 0.08 to 0.33 per cent. C, 6 to 35 tons, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), under 10 tons, £34 17s. 0d.; silico-manganese, under 10 tons, £43 16s. 6d.; free-cutting, under 10 tons, £36 14s. 6d. SIEMENS MARTIN ACID (under 10 tons): Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

Billets, Blooms, and Slabs for Forging and for Stamping (under 10 tons).—BASIC: soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections (1 ton to 10 tons).—Ship plate (N.-E. Coast), £41 12s. 0d.; boiler plates (N.-E. Coast), £44 2s. 0d.; floor plates (N.-E. Coast), £43 10s. 0d.; angles (N.-E. Coast), £38 16s. 6d.; joists (N.-E. Coast), £38 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £39 1s. 0d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, 100 tons and over, £38 0s. 0d.; uncoated strip mill coils, hot rolled, under 3 mm. to 12g., 25 tons to under 50 tons, £43 16s. 0d.; black sheets (hand mill), 24g., 10 tons and over, £57 14s. 6d.; galvanized corrugated sheets, 24g., 10 tons and over, £68 5s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £67 17s. 0d.; nickel-chrome, £98 11s. 0d.; nickel-chrome-molybdenum, £111 4s. 0d., in lots of 5 tons to under 10 tons.

NON-FERROUS METALS

Copper.—Cash, £236 0s. 0d. to £236 5s. 0d.; three months, £236 0s. 0d. to £236 5s. 0d.; settlement, £236 5s. 0d.

Copper, Tubes, etc.—Solid-drawn tubes, 2s. 3⅝d. per lb.; rods, 250s. 0d. per cwt. basis; 20 s.w.g., 285s. 0d. per cwt.

Tin.—Cash, £800 0s. 0d. to £801 0s. 0d.; three months, £800 0s. 0d. to £800 10s. 0d.; settlement, £801 0s. 0d.

Lead (Refined Pig).—First half September, £70 15s. 0d. to £71 0s. 0d.; first half December, £70 15s. 0d. to £71 0s. 6d.

Zinc.—First half September, £86 2s. 6d. to £86 7s. 6d.; first half December, £86 2s. 6d. to £86 5s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £121 17s. 6d.; rolled zinc (boiler plates), all English destinations, £119 12s. 6d.; zinc oxide (Red Seal), d/d buyers' premises, £100 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 10⅞d. per lb.; sheets to 10 w.g., 206s. 0d. per cwt.; wire, 2s. 8¼d.; rolled metal, 206s. 0d. per cwt.

Brass (Brazing).—BS1400, B3, £171; B6, £220.

Brass (High Tensile).—BS1400, HTB1, £196; HTB2, £213; HTB3, £231.

Gunmetal.—BS1400, LG2, £215; LG3, £225; G1, 1% £284; G1, 1%, £273.

Phosphor Bronze.—BS1400, PB1 (AID released), £310; BS1400, 90/10/1, £298.

Leaded Phosphor Bronze.—BS1400, LPB1, £235.

Phosphor Bronze Strip, etc.—Strip, 293s. 3d. per cwt.; wire, 4s. 1⅞d. per lb.; rods, 3s. 4¼d.; tubes, 3s. 4¼d.; chill cast bars, solids 3s. 3⅞d.; cored 3s. 4¼d (CHARLES CLIFFORD, LIMITED).

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide x 0.056, 3s. 11½d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 4¼d.; special quality turning rod, 10 per cent. ½ in. dia., in straight lengths, 4s. 3¼d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 2¼d. to 2s. 3d. per lb.; Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £69 15s. 0d. to £70 0s. 0d. Nickel, £600 0s. 0d. Aluminium, ingots, £186 0s. 0d.; aluminium bronze (BS1400), AB1, £250, AB2, £259.

* Average 68-70 per cent.

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travels long distances to meet the needs of the Foundry—to Scotland and South Wales, to Scandinavia and Singapore, and many other places overseas.

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Imports and Exports of Iron and Steel in July

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in July this year. Totals for the first seven months of this year and last are also included.

Total Exports of Iron and Steel

Destination.	Month ended July 31.	Seven months ended July 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Cyprus	60	911	928
Sierra Leone	326	6,055	3,135
Ghana	1,414	17,965	11,394
Nigeria	6,200	44,271	37,189
Union of South Africa	4,031	26,079	43,922
Rhodesia and Nyasaland	2,030	13,012	15,191
Tanganyika	2,122	10,300	8,478
Kenya	2,480	11,998	17,550
Uganda	35	2,924	718
Mauritius	455	824	2,731
Aden	419	1,748	1,501
Bahrein, Qatar, and Trucial States	172	4,905	8,496
Kuwait	566	7,432	4,777
India	39,384	103,373	166,740
Pakistan	7,133	19,680	42,240
Singapore	2,152	12,971	11,774
Malaya	906	6,529	11,467
Ceylon	1,979	27,182	32,080
British North Borneo	253	1,743	2,531
Hongkong	6,527	40,763	48,940
Australia	16,562	49,655	100,522
New Zealand	11,959	55,199	62,708
Canada	11,891	99,940	139,348
Jamaica	1,401	13,252	14,269
Trinidad	4,357	26,052	26,796
British Guiana	830	4,192	5,421
Other Commonwealth countries	2,177	21,572	22,228
Eire	4,865	27,445	35,443
Soviet Union	3,139	7,501	20,108
Finland	5,350	20,078	28,201
Sweden	12,146	67,714	108,827
Norway	6,505	52,430	69,977
Denmark	8,462	56,101	59,270
Western Germany	8,735	63,320	87,404
Netherlands	12,076	55,870	77,712
Belgium	2,441	17,262	22,295
France	1,393	1,627	4,682
Switzerland	1,115	4,810	7,555
Portugal	1,339	9,737	9,324
Spain	4,359	19,115	31,027
Italy	3,494	31,669	24,917
Austria	402	2,108	3,095
Yugoslavia	2,367	1,776	24,102
Greece	3,535	6,972	11,766
Turkey	1,678	4,059	7,589
Netherlands Antilles	172	1,694	2,434
Portuguese East Africa	711	810	2,773
Egypt	407	1,272	6,975
Sudan	737	4,910	5,831
Lebanon	69	1,739	741
Israel	1,064	7,745	12,307
Saudi Arabia	84	2,824	298
Iraq	3,422	50,810	18,606
Iran	5,663	16,854	43,339
Burma	243	5,655	4,314
Thailand	391	5,677	3,545
Indonesia	2,271	3,310	17,320
China	4,520	27,343	35,691
Japan	3,138	84,745	43,662
Philippine Republic	661	3,098	5,345
USA	7,228	90,486	147,540
Cuba	250	4,480	5,452
Colombia	783	1,536	5,949
Venezuela	1,390	46,575	24,261
Ecuador	81	546	1,609
Peru	967	1,460	4,404
Chile	565	915	2,187
Brazil	1,325	15,327	21,180
Uruguay	288	705	5,271
Argentina	7,753	122,321	57,338
Other foreign countries	10,347	42,230	73,433
TOTAL	265,752	1,625,188	2,026,173

FIRST Siemens-Martin furnace is now being built at the Huneadora steelworks in Rumania. The unit will have an annual capacity of 350,000 *tonnes*.

Total Imports of Iron and Steel

From	Month ended July 31.	Seven months ended July 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Union of South Africa	2,136	12,726	20,877
Rhodesia and Nyasaland	491	2,981	4,325
Canada	49,663	9,744	95,206
Other Commonwealth countries and Eire	7,104	6,640	21,914
Soviet Union	6,323	25,353	22,811
Sweden	4,601	15,234	28,573
Norway	13,895	47,056	89,843
Poland	139	3,222	8,056
Western Germany	11,540	34,864	90,655
Netherlands	15,488	103,507	129,409
Belgium	12,121	14,526	73,272
Luxembourg	1,503	4,495	9,530
France	6,638	13,410	42,099
Italy	1,366	8,054	18,443
Austria	1,224	2,537	7,845
Japan	567	1,410	4,015
U.S.A.	78,065	17,973	252,405
Other foreign countries	12,271	8,643	59,368
TOTAL	225,135	332,375	978,787
Iron and steel scrap and waste, fit only for the recovery of metal	25,299	2,511	97,834

Exports of Iron and Steel, by Product

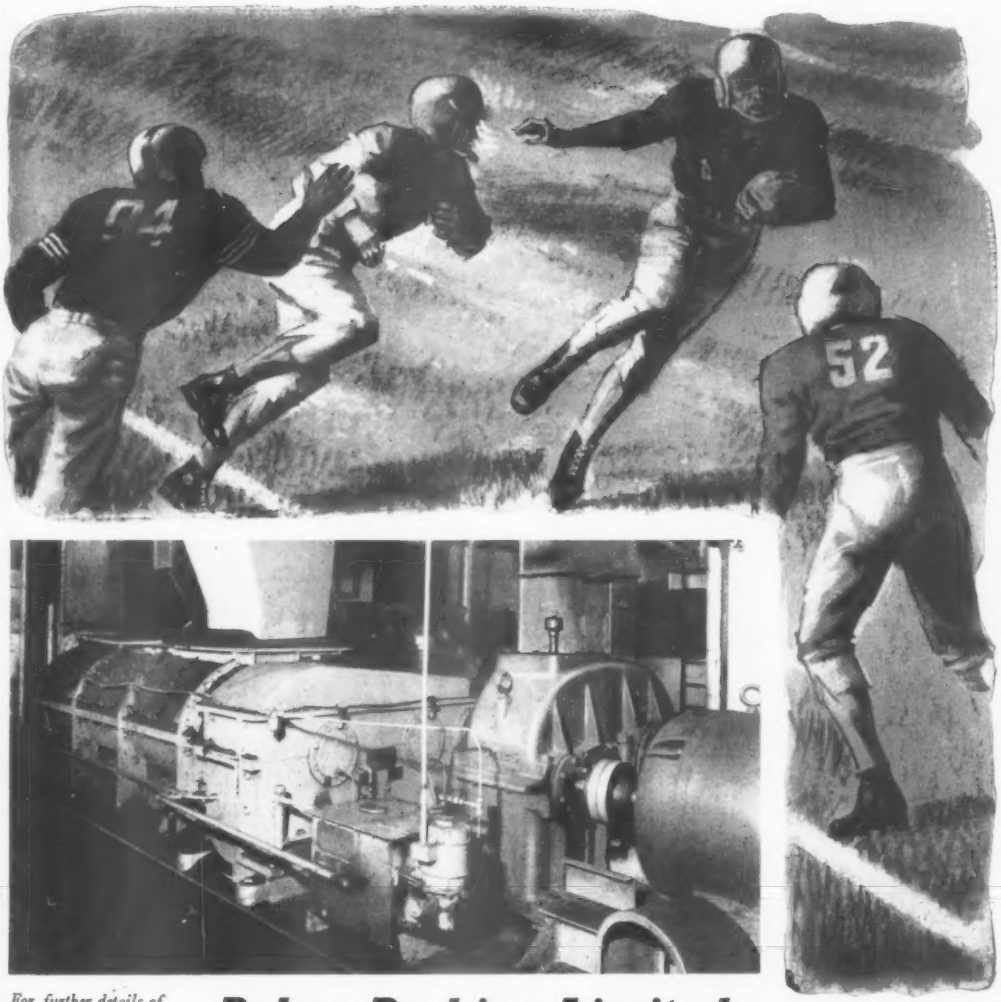
Product.	Month ended July 31.	Seven months ended July 31.	
	1960.	1959.	1960.
	Tons.	Tons.	Tons.
Pig-iron	9,599	72,239	102,095
Ferro-columbium (niobium)	4	26	78
Ferro-tungsten	28	739	514
Other ferro-alloys	511	2,987	6,172
Ingots, blooms, billets, slabs, sheet bars (incl. tinplate bars), and similar primary forms	801	42,530	20,782
Pieces roughly shaped by forging	110	1,018	775
Iron bars, rods, angles, shapes, and sections	251	764	1,102
Steel bars, rods, angles, sections, and shapes	51,669	215,118	378,057
Iron plates and sheets	134	238	527
Universal plates	2,499	4,614	13,008
Steel plate, 3mm. and under 4.5mm. thickness	3,874	26,603	24,344
Ditto, 4.5mm. or more in thickness	28,339	109,766	204,516
Blacksheets and blackplate	25,618	153,673	179,402
Hoop and strip	9,673	49,379	60,511
Tinplate	41,659	275,842	316,852
Decorated tinplate	596	5,529	2,970
Galvanized sheets	7,425	53,223	49,991
Other (incl. tinned sheets, terneplate, and ternesheets)	1,733	12,569	15,740
Railway and tramway construction material	21,381	97,808	102,415
Wire rods of steel (incl. alloy steel)	4,791	30,598	33,437
Wire	8,395	61,918	72,145
Tubes, pipes and fittings	46,662	408,007	440,730
TOTAL	265,752	1,625,188	2,026,173

NEW HEADQUARTERS of the British Shipbuilding Research Association is the 10-floor Prince Consort House, 27-29, Albert Embankment, London. Initially the association will use only six floors of the building which it hopes to move into at the end of the year.

BAKER PERKINS FOUNDRY TEAM

-proved unbeatable in U.S.A.

The photograph below shows one of eight matched Baker Perkins units chosen to provide all the mixing requirements for an automotive grey iron foundry in the U.S.A. A strong line of five B-P (150 tons per hour) 5A Continuous Moulding Sand Mullers delivers consistently uniform sand into the moulding shop.
Behind them a B-P Core Paste Mixer and a B-P Core Wash Mixer ensure excellent core surfaces. Centre of the team is the B-P Refractory Clay Mixer for lining ladles and cupolas.
After four years of gruelling operation this B-P equipment has proved itself in all respects. It is built to do a rugged job consistently and with minimum maintenance.



For further details of this and other foundry machinery write to:

Baker Perkins Limited, *Engineers*

BEDEWELL DIVISION, HEBBURN-ON-TYNE, Co. DURHAM.

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BPF9

CLASSIFIED ADVERTISEMENTS

PREPAID RATES: Fifteen words for 7/6 (minimum charge) and 4d. per word thereafter. Box Numbers 2/6 extra per insertion (including postage of replies). Situations wanted 2d. per word throughout.

Advertisements (accompanied by a remittance) and replies to Box Numbers should be addressed to the Advertisement Manager, Foundry Trade Journal, John Adam House 17/19, John Adam Street, Adelphi, London, W.C.2. If received by first post Monday advertisements can normally be accommodated in the following Thursday's issue.

SITUATIONS WANTED

YOUNG MAN, 30, well educated, City and Guilds Foundry practice and Diploma National Foundry College, executive, laboratory and sales experience, seeks interesting position in the foundry or allied industries in the London area. Prospects more important than starting salary. Box YM803, FOUNDRY TRADE JOURNAL.

TECHNICAL ENGINEER wishes to represent a Foundry for Grey Iron, Aluminium and Non-ferrous Metals Die-castings in Aluminium, Mazak Lead, and Tin Alloys, etc. First-class connection with works in London and Home Counties. Part expenses and commission. Box TE821, FOUNDRY TRADE JOURNAL.

PRACTICAL Foundry Manager/Superintendent. Whiteheart, Blackheart, Grey. Fourteen years executive, jobbing, mechanisation, capable full control. Seeks post Wolverhampton area. Box PF818, FOUNDRY TRADE JOURNAL.

FOREMAN PATTERNMAKER, A.M.I.B.F., age 38 years, requires position as representative in Pattern or Foundry Supplies, etc. Wide experience in both trades. Any area. Box FP817, FOUNDRY TRADE JOURNAL.

FOUNDRY MANAGER, 45, seeks change, preferably in Scotland. Wide experience in copper base and light alloys, modern foundry practice and technique. Position as representative considered. Box FM819, FOUNDRY TRADE JOURNAL.

GENERAL MANAGER (36) of firm of Ironfounders with an annual output in excess of 15,000 tons wishes, for domestic reasons, to obtain a suitable post in the North of England. Basically trained as Cost Accountant but fully experienced in most facets of modern foundry management. Extensive knowledge of the market and the various trade associations. Specialised knowledge of the National Engineering Agreements and used to working with trades unions. Would be willing to accept a salary of below £1,500 per annum for an interesting post in a company with a progressive outlook. Suitable housing accommodation would be appreciated. Box GM820, FOUNDRY TRADE JOURNAL.

FOUNDRYMAN, 35, B.Sc., A.M.I.B.F., looking for a new post. Knowledge and experience of iron, steel and non-ferrous founding. Would consider technical, supervision, management or representation. Prospects as important as initial salary. Box FO814, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT

FOUNDRY FOREMAN. THOMAS POTTERTON LTD. (De La Rue subsidiary), Emscote Road, Warwick, have a vacancy for a man experienced in light grey iron castings up to half ton using floor and mechanised production methods; must be first class foundry man capable of training labour and directing operations on shop floor. Only those wishing to progress to a more senior post later on need apply. Send full details of age, experience and salary required to PERSONNEL OFFICER.

SITUATIONS VACANT—*contd.*

A VACANCY exists for YOUNG TECHNICIAN in the Process Control and Development section of an Investment Foundry. Previous experience in this field of metallurgical engineering is not essential. Apply giving full details of education, previous experience, etc., to P. I. CASTINGS (ALTRINCHAM) LTD., Atlantic Street, Altrincham.

FOUNDRY METALLURGIST required for modern mechanised Non-ferrous Foundry. Responsible to Foundry Manager for full process control, that is, analytical Laboratory, Sand Melting and Temperature control. Experience in H.F. Stainless Steel melting and Shell process an advantage. Applications to FOUNDRY MANAGER, Dewrance & Co., Limited, Hillington, Glasgow, S.W.2.

WORK STUDY ENGINEER required for high class Automobile Foundry. Applications are invited from men aged 25 to 40, who have had sound training in Work Study practice, and in particular, practical experience in Work Measurement. Foundry knowledge desirable, but not essential. Apply in writing, stating age, experience and salary required, to: IDOSON MOTOR CYLINDER CO., LTD., Hainge Road, Tividale, Tipton, Staffs.

FOUNDRY FOREMAN. A clear-cut opportunity occurs for keen young man to progress to foundry management. Practical knowledge of grey iron work on heavy section machine tool castings essential. Theoretical knowledge and supervision experience distinct advantages. The foundry, which is located in West Yorkshire, produces an average 80 tons per month, maximum weight 25 tons, with supervisory staff of three. Applications should give full details of previous experience in chronological order, technical education and commencing salary required to Box FF783, FOUNDRY TRADE JOURNAL.

SITUATIONS VACANT—*contd.*

STEEL FOUNDRY SUPERINTENDENT AUSTRALIA

WANTED.—An experienced Superintendent for an electric steel foundry organisation employing around 250 operators. The person required must be a Journeyman Steel Moulder with C & G qualifications plus 10 years' post apprenticeship experience in Jobbing and Machine Moulding producing castings up to 10 tons weight. Applications giving fullest personal details, trade experience and salary expected, Box WA775, FOUNDRY TRADE JOURNAL.

A FOUNDRY MAN is required for a Modern Steel Foundry in the South of England. Applicants must be time-served moulders with experience of shell moulding and preferably the carbon dioxide process. They should be good disciplinarians and have experience of incentive schemes and be able to show evidence of a strong organising ability. Preferred ages, 35 to 45. A good salary will be paid to the right applicant, together with Pension and Life Assurance benefits. Consideration will be given to assistance in rehousing if appropriate. Write, giving brief details of age, qualifications and experience, to Box AF818, FOUNDRY TRADE JOURNAL.

APPLICATIONS are invited from persons with Metallurgical and Foundry experience to be responsible for Quality Control activities in a Foundry producing steel and high alloy castings by the Lost Wax and Shell Moulding techniques. In addition to the experience quoted, enthusiasm, initiative and attention to detail are essential. Applications with full details of education, qualifications and experience to date, should be sent, in confidence, to the PERSONNEL MANAGER, Hadfields Ltd., East Hecla Works, Vulcan Road, Sheffield, 9.

FOUNDRY WORKS MANAGER
for
VICTORIA AUSTRALIA

We have been engaged to select candidates for this appointment with a rapidly expanding modern mechanised Iron Foundry, making automotive castings. This is a subsidiary of a leading United Kingdom organisation.

Candidates should have comprehensive foundry operating experience on mass production castings.

Age range 35–45.
Commencing Salary £A3,000,
equivalent to £2,400 sterling,
with Service Agreement.

Considerate Pension Scheme and other generous benefits.

Free travel to Australia for the successful candidate and his family.

An opportunity for a career in Australia's growing economy, with the benefits of its climate and amenities for the family.

Apply, in confidence, stating age, qualifications, experience and recent earnings, and quoting ref. FWM/FT, to:

MANAGERIAL APPOINTMENTS, LTD.,
Brook House, Park Lane, London, W.1.

Every application will be acknowledged.

SITUATIONS VACANT—*contd.*

A YOUNG, energetic Foundryman is required as JUNIOR FOREMAN in a South of England Iron Foundry. A good basic training is essential and there are excellent prospects for the right man. Apply Box AY804, FOUNDRY TRADE JOURNAL.

FOUNDRY METALLURGIST required for Ferrous Foundry (mechanised) situated in East Anglia. Cupola control essential and must have practical experience in sand control. Send details of experience, age and salary to Box FM806, FOUNDRY TRADE JOURNAL.

SENIOR FOUNDRY ESTIMATOR required, capable of calculating casting weights and production costs and organising estimating department. Please reply stating age, experience and salary required to Box SF815, FOUNDRY TRADE JOURNAL.

CHIEF METALLURGIST required for Foundry producing steel by the Tropenas, Arc and High Frequency Furnaces and using both Hot Blast and normal Cold Blast Cupolas. The Metallurgist will take complete control of the Laboratory and Melting Plant, including the control of the labour. Box CM811, FOUNDRY TRADE JOURNAL.

TIME STUDY ENGINEER for Iron Foundry recently modernised with continuous track and sand slinger sections. Castings up to 15 cwt. Applicants, preferable age 25-35, must have sound time study and rating training with practical experience of these techniques in a modern Foundry. Salary £850/£900 per annum. Good prospects in an expanding Company. Attractive Pension Scheme. Assistance with removal expenses. Full details of age, experience, etc., to PERSONNEL OFFICER, Hamworthy Engineering, Ltd., Poole, Dorset.

FOUNDRY FOREMAN (30-35 approx.) required for large Engineering Company in East Anglia. Should possess City & Guilds or equivalent qualification and have been trained in jobbing foundry. Experience of mechanised foundries and labour control would be additional assets. Attractive Staff Pension Scheme in operation. Applications, giving full details of age, qualifications, experience and training, with indication of salary required, to Box FF809, FOUNDRY TRADE JOURNAL.

WELL KNOWN West Midland firm of Ironfounders and Engineers wishes to engage an energetic young man for future Technical Sales Representation. Basic requirements are: Age 20-25 years, education—good G.C.E. level, practical experience—sound training in modern ironfoundry practice and pattern making. This post should prove of interest to a suitably trained man to embark on a Technical Sales career with an expanding and progressive Company. Full details of age, education, technical training and positions held to MANAGING DIRECTOR, Box FT815, FOUNDRY TRADE JOURNAL.

APPLEBY - FRODINGHAM STEEL COMPANY, SCUNTHORPE, LINCOLNSHIRE, invite applications for a SENIOR DESIGNER with experience of heavy PLATE AND SECTION ROLLING MILLS PLANT.

Permanent situation with interesting and varied work.

Apply giving age, full particulars of experience, etc., to THE CHIEF ENGINEER.

SITUATIONS VACANT—*contd.*

CUPOLA FURNACEMAN required by old established iron foundry. Good rates. Write or phone H. HENDRA & SON, Beddington Lane, Croydon, Surrey. THO 1416.

WILSONS FOUNDRY AND ENGINEERING COMPANY LTD., BISHOP AUCKLAND, Co. Durham

has a vacancy for:—

FOREMAN for Fettling & Dressing Shop, Steel Castings.

ESSENTIAL fully experienced in this work, and have complete knowledge of requirements in production high quality steel castings up to 3 tons in weight.

Responsible for output to a planned programme, and based on an established personnel.

Four-figure salary for the right man. Pension scheme. Three weeks holiday.

STEWARTS AND LLOYDS, LIMITED require a

MOULDING SHOP SUPERINTENDENT

TO take charge of Moulding, Coremaking and Sand Preparation Departments at their TOLCROSS STEEL FOUNDRY, near GLASGOW.

Applicants should have a thorough practical knowledge of modern steel foundry practice, including air-set oils, and should preferably have worked with both alloy and plain carbon steel castings in the weight range up to 6 tons.

Written applications, giving full details of education, qualifications, experience and age, should be sent to MANAGER, PERSONNEL SERVICES, Clyde Office, Coatbridge.

METALLURGIST required for steel foundry technical control duties, together with development work in both the sand and metallurgical fields. Applicants should have experience in ferrous metallurgy and foundry experience would be an added advantage. This appointment carries an attractive salary and non-contributory pension benefits. Assistance with housing would be provided, if necessary. Apply in writing, giving details of qualifications and experience to THE CHIEF METALLURGIST, Catton & Co. Ltd., 29, Chadwick Street, Leeds, 10.

MACHINERY WANTED

WANTED by small Foundry, cheap, Pneumatic Chipping Hammers, Abrasive Cut Off, Driller, etc. Box WH815, FOUNDRY TRADE JOURNAL.

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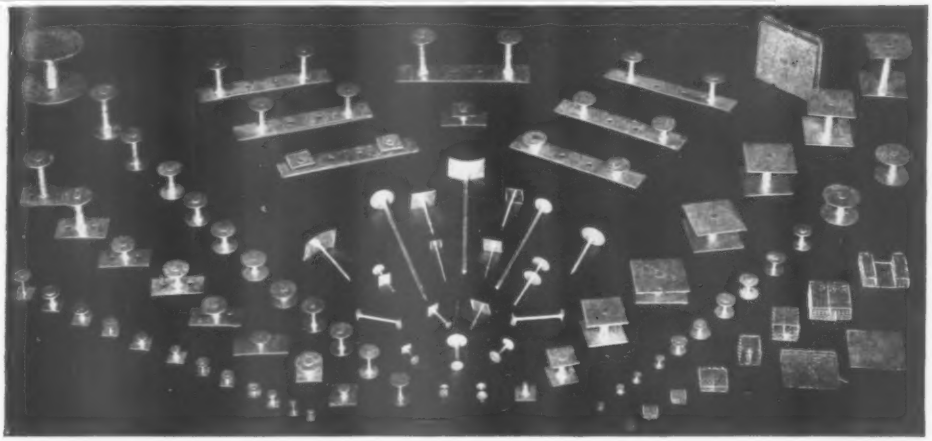

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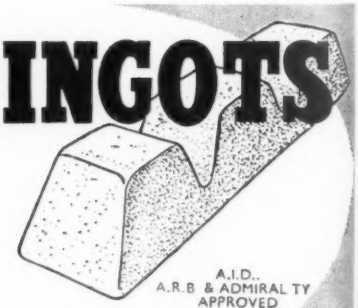

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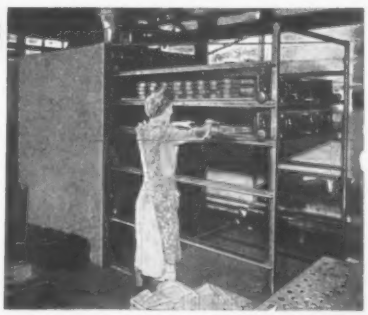

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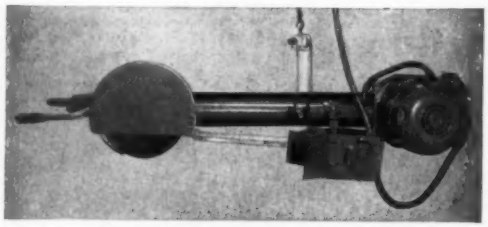

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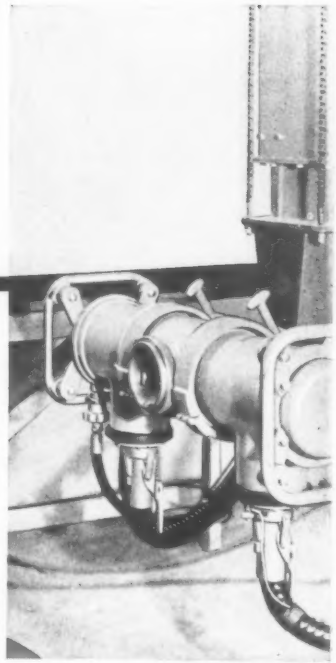

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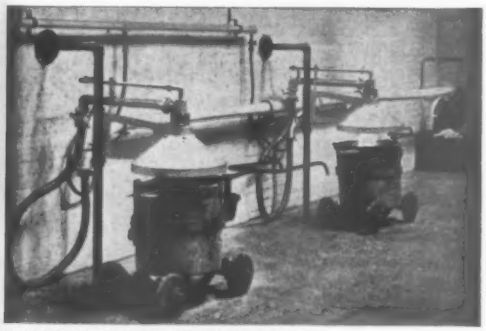

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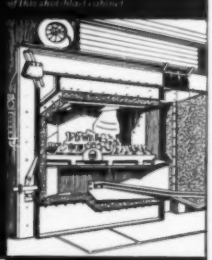

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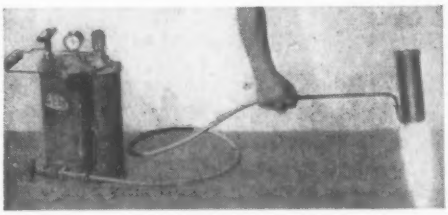

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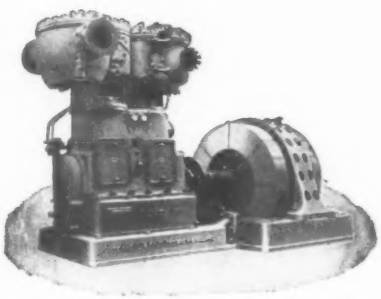

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	PAGE NOS.
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Air Control Installations Ltd.	—
Albion Diemakers, Ltd.	—
Alcan (U.K.), Ltd.	—
Allan, John, & Co. (Glenpark), Ltd.	29
Allen, W. G., & Sons (Tipton), Ltd.	—
Amafond	—
Amber Oils, Ltd.	—
Anderson-Grice Co., Ltd.	—
Annealers, Ltd.	—
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Armstrong Whitworth & Co. (Pneu. Tools), Ltd.	—
Ashworth Ross Co., Ltd.	—
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Atlas Copco (G.B.), Ltd.	313
August's, Ltd.	36
Austin, E., & Sons, Ltd.	—
Badische Maschinenfabrik A.-G.	14
Bairds & Scottish Steel, Ltd.	—
Baker Perkins, Ltd.	37
Balbardie, Ltd.	311
Ballard, F. J., & Co., Ltd.	45
Ballinger, L. J. H., Ltd.	46
Beck, H., & Son, Ltd.	40
Bellias & Morcom, Ltd.	—
Bennett, H. G., & Co. (Gloves) Ltd.	—
Berk, F. W., & Co., Ltd.	—
Bilston Shot & Grit Co., Ltd.	—
Bilston Stove & Steel Truck Co., Ltd.	43
Birkett, F. W., & Co., Ltd.	—
Birlec-Efco (Melting), Ltd.	—
Blackwell's Metallurgical Works, Ltd.	—
Block & Anderson, Ltd.	—
Bloomer-Holt, Ltd.	—
Boydell, E., & Co., Ltd.	—
Bradbury, John, & Co. (Stockport), Ltd.	—
Bradley & Foster, Ltd.	17
British Acheson Electrodes, Ltd.	—
British Aero Components Ld.	—
British Electrical Repairs, Ltd.	—
British Foundry Units, Ltd.	12
British Industrial Sand Ltd.	—
British Iron & Steel Federation	—
British Mono Rail, Ltd.	—
British Moulding Machine Co., Ltd.	10 & 11
British Oxygen Co., Ltd.	—
British Ronceray, Ltd.	—
British Shotblast & Engineering Co., Ltd.	—
Bromhead & Denison, Ltd.	—
Broom & Wade, Ltd.	—
Buckland Sand & Silica Co., Ltd.	—
Burn, John, & Co. (B'ham), Ltd.	41
Carborundum Co., Ltd.	—
Catalin, Ltd.	—
Cawood Wharton & Co., Ltd.	49
Centrozap Foundry Machines	—
Cohen, Geo. Sons & Co., Ltd.	2
Chemicals & Feeds, Ltd.	—
Chetham Timber Co., Ltd.	—
Ciba (A.R.L.), Ltd.	—
City Casting & Metal Co. Ltd.	44
Clayton Crane & Hoist Co. Ld.	—
Coleman-Wallwork Co., Ltd.	19
Combustion Chemicals, Ltd.	—
Consolidated Pneumatic Tool Co., Ltd.	—
Constructional Engineering Co., Ltd., The	52
Controlled Heat & Air, Ltd.	—
Cooke, Bailey, Ltd.	—
Cox & Danks, Ltd.	—
Crockett Lowe, Ltd.	—
Crookes, L. E.	—
Cumming, Wm., & Co., Ltd.	31
Cupodel, Ltd.	—
Dallow, Lambert & Co., Ltd.	315
Distillers Co., Ltd., The	—
Distington Engineering Co., Ltd.	—
Dowler, H. J., Engineers & Pattern Makers, Ltd.	—
Dowson & Mason, Ltd.	—
Dunford & Elliott, Ltd.	—
Durrans, James, & Sons, Ltd.	51
Dustraction, Ltd.	—
Dustuctor Co., Ltd.	20
Dyson, J. & J., Ltd.	—
Electrical Development Assoc.	—
Electrogenerators, Ltd.	—
Elliott, E., & C., Ltd.	—
Engineering Services (Manchester), Ltd.	—
Escol Products, Ltd.	—
Evans, Roy, M.I.B.F.	—
Evans, Stanley N., Ltd.	—
Eyre Smelting Co., Ltd.	46
F. & M. Supplies, Ltd.	309
Felco Hoists, Ltd.	—
Filter-Heat Ltd.	23
Fischer, George, Ltd.	—
Fisher-Foundries, Ltd.	—
Fletcher Miller, Ltd.	44
Flextol Engineering Co., Ltd.	—
Floodgate Steel Fabricating Co., Ltd.	—
Fordath Engineering Co., Ltd.	34
Foundry Equipment, Ltd.	26 & 27
Foundry Mechanisations (Baillot), Ltd.	15
Foundry & Metallurgical Equipment Co., Ltd.	—
Foundry Plant & Machinery, Ltd.	18
Foundry Services, Ltd.	7, 8, 9
Foundry Suppliers, Ltd.	—
Foxboro-Yoxall, Ltd.	—
Franklin Furnaces, Ltd.	—
Fuel & Metallurgical Processes, Ltd.	—
Fullers' Earth Union, Ltd., The	32
G.W.B. Furnaces, Ltd.	5
Gadd, Thos.	49
Gas Council	—
General Refractories Ltd.	—
Gilbert, G. & R. (Industrial), Ltd.	—
Gliksten, J., & Son, Ltd.	—
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Griffiths, A. E. (Smethwick), Ltd.	—
Guest, Keen Iron & Steel Co., Ltd.	—
Harborough Construction Co., Ltd.	—
Hargraves Bros. (Manchester), Ltd.	42
Harris & Pearson, Ltd.	—
Harvey & Longstaffe, Ltd.	—
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Hatcham Rubber Co., Ltd.	—
Hedin, Ltd.	—
Heneage Metals, Ltd.	—
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Incandescent Heat Co., Ltd.	—
Ingersoll-Rand Co., Ltd.	—
Jackman, J. W., & Co., Ltd.	3
Jacks, Wm., & Co., Ltd.	317
Joy-Sullivan, Ltd.	—
Keith-Blackman, Ltd.	—
Kenilworth Mfg. Co., Ltd.	4
King, Geo. W., Ltd.	—
Lafarge Aluminous Cement Co., Ltd.	—
Laidlaw, Drew & Co., Ltd.	47
Lazarus, Leopold, Ltd.	—
Leicester Lovell & Co., Ltd.	—
Levy, B., & Co. (Patterns), Ltd.	42
L.M.S. Products, Ltd.	—
Lones, Joseph Laboratories	—
Lord, E. S., Ltd.	—
Luke & Spencer, Ltd.	13
Macnab & Co., Ltd.	—
Major, Robinson & Co., Ltd.	47
Mansfield Standard Sand Co., Ltd.	317
Marco Conveyor & Engineering Co., Ltd.	21
Mathison, John, Ltd.	30
Matthews & Yates, Ltd.	—
May, J. H., Ltd.	—
McKechnie Bros., Ltd.	—
Metalectric Furnaces, Ltd.	—
Metalline Cement Co., The	42
Metals & Equipment (Wolverhampton), Ltd.	—
Midgley & Son, Ltd.	—
Midland Monolithic Furnace Lining Co., Ltd.	42
Mine Safety Appliances, Ltd.	—
Modern Furnaces & Stoves, Ltd.	—
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Monometer Manufacturing Co., Ltd.	—
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Morgan Crucible Co., Ltd.	—
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Moyle, Victor & Co., Ltd.	—
Muir, Murray & Co., Ltd.	—
Newton Collins, Ltd.	—
Newman Hender & Co., Ltd.	—
Nicholl & Wood, Ltd.	43
Norris Equipment & Construction, Ltd.	—
Ormerod, R. E., Ltd.	—
Palmer Aero Products, Ltd.	47
Parish, J., & Co., Ltd.	52
Park & Paterson, Ltd.	—
Passe, J. F., & Co.	42
Paterson Hughes Engineering Co., Ltd.	—
Patterncrafts, Ltd.	—
Pearson, E. J. & J., Ltd.	—
Peco Machinery Sales, Ltd.	—
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Pickford, Holland, Ltd.	—
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Podmore, W., & Sons, Ltd.	—
Polford Engineering Co., Ltd.	24 & 25
Polygram Castings Co., Ltd.	—
Precision Presswork Co., Ltd.	—
Price, J. T., & Co., Ltd.	—
Production Chemicals (Rochdale), Ltd.	49
Purimachos, Ltd.	—
Reavell & Co., Ltd.	49
Refined Iron Co. (Darwen), Ltd.	—
Reid, Wm., & Co.	42
Resinous Chemicals, Ltd.	—
Richards Structural Steel Co., Ltd.	—
Richardson Eng'g., Ltd.	—
Richardsons, R. J. & Sons Ltd.	—
Ridsdale & Co., Ltd.	—
Riley (IC) Products, Ltd.	—
Robson Refractories, Ltd.	52
Roper, E. A., & Co., Ltd.	—
Rowland, F. E., & Co., Ltd.	—
Rownson (Conveyors), Ltd.	—
Rubery Owen & Co., Ltd.	—
Rule & Moffat	—
Rustless Iron Co., Ltd.	—
Safety Products, Ltd.	—
Salter, Geo. & Co., Ltd.	28
St. George's Engineers, Ltd.	46
Sheffield Smelting Co., Ltd.	16
Shell Chemical Co., Ltd.	—
Sinex Eng'g. Co., Ltd.	—
Sklenar Furnaces, Ltd.	—
Smedley Bros., Ltd.	—
Smeeton, J. A., Ltd.	—
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Stanton Ironworks Co., Ltd., The	—
Staveley Iron & Chemical Co., Ltd.	—
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Stein, John G., & Co., Ltd.	—
Sterling Foundry Specialties, Ltd.	1
Sternol, Ltd.	—
Stott, S. S., Ltd.	—
Suffolk Iron Foundry (1920), Ltd.	—
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Thompson, John, Instrument Co., Ltd.	—
Thomson & McIntyre	—
Tilghman's, Ltd.	6
Union Carbide, Ltd.	—
Unit Engineering Co.	—
United Fireclay Products, Ltd.	—
United States Metallic Packing Co., Ltd.	—
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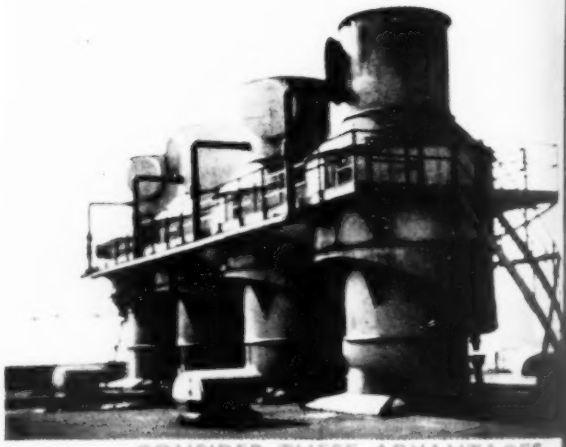

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